COMMERCE
MAGAZINE

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DECEMBER, 1949

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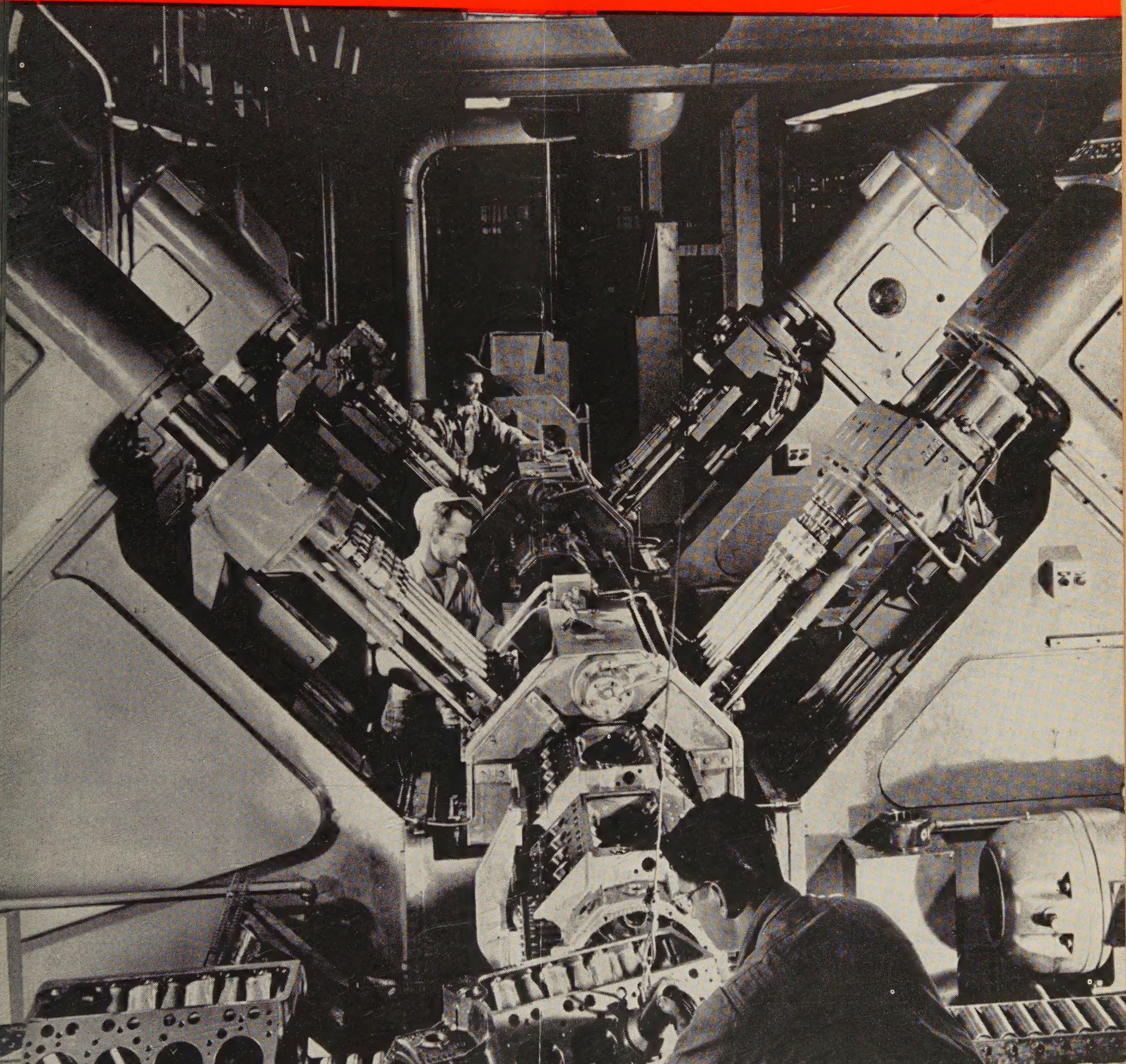

General Motors Corp.

Auto makers strive for economy: at Oldsmobile's Lansing plant labor-saving machines quick-drill bores of banked cylinder block.

Operation Cost-Cutting—See Page 13

Want to make a river run uphill?

...Steel is ready to help!

Steel pipe ready for installation at Grand Coulee Dam, Washington.

Paul Bunyan's eyes would have popped with amazement if he could have seen the way puny modern man is handling water. Skyscraping walls of concrete and steel are flung across valleys to make crystal lakes . . . rivers of water are siphoned over mountains in pipes of steel.

And big jobs are ahead. Public Health Service engineers report that *108 million* Americans lack adequate water supplies, and it's estimated that *17 million* acres of undeveloped land in the West can be irrigated, transformed into fertile farms.

To help put water where it's needed, United States Steel has supplied steel pipe so big you could drive a bus through it, and other sizes to conduct any quantity of water from a creek or a brook down to a sprinkle for your garden. We've built bridges to carry our gigantic pipes over Nature's own streams . . . we've made the cables that suspend steel siphon lines across chasms.

Whatever the job the nation has—United States Steel is ready to help. *More than a billion dollars worth* of additions and improvements to U. S. Steel plants—all started since the end of the war—are nearly completed.

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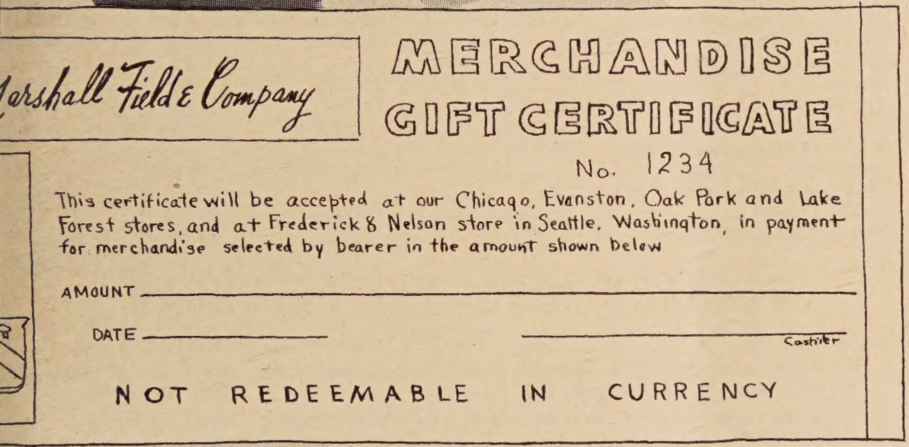

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STATISTICS OF
CHICAGO BUSINESS

	October, 1949	Sept., 1949	October, 194
Building permits	703	837	51
Cost	$12,952,000	$12,519,700	$14,032,80
Contracts awarded on building projects, Cook Co.	1,821	1,296	1,10
Cost	$42,882,000	$35,958,000	$30,346,00
(F. W. Dodge Corp.)			
Real Estate transfers	6,117	6,041	5,99
Consideration	$6,587,146	$6,601,243	$8,322,45
Retailers' Occupational Tax collection, Cook Co.	$7,669,222	$7,155,960	$7,447,03
Department store sales index	223.6	242.7	253.
(Federal Reserve Board)			
(Daily average 1935-39=100)			
Bank clearings	$2,982,319,786	$2,971,877,232	$3,307,667,93
Bank debits to individual accounts:			
7th Federal Reserve District	$14,991,000,000	$14,907,000,000	$16,521,000,00
Chicago only	$7,421,894,000	$7,450,864,000	$8,662,053,00
Midwest Stock Exchange transactions:			
Number of shares traded	640,000	551,000	607,00
Market value of shares traded	$16,751,447	$13,394,894	$16,374,85
Railway Express shipments, Chicago area	1,257,360	1,230,640	1,597,68
Air express shipments, Chicago area	55,419	51,357	54,64
L.C.L. merchandise cars	23,072	22,555	29,52
Originating local telephone messages	171,269,662	169,332,081	176,220,55
Electric power production, kwh.	952,874,000	958,635,000	1,014,746,00
Revenue passengers carried by Chicago Transit Authority lines:			
Surface Division	58,900,772	58,365,127	68,207,55
Rapid Transit Division	12,868,902	12,628,871	14,700,84
Postal receipts	$9,833,364	$9,722,565	$9,212,71
Air passengers:			
Arrivals	137,034	139,545	121,39
Departures	141,803	141,680	120,47
Consumers' Price Index (1935-39=100)	174.4	175.8	178.1
Live stock slaughtered under federal inspection	584,679	497,102	577,63
Families on relief rolls:			
Cook County	28,641	27,511	19,22
Other Illinois counties	19,568	18,040	14,34

JANUARY, 1950, TAX CALENDAR

Date Due	Tax	Returnable to
1	Application for state motor vehicle licenses and city vehicle stickers now past due	Secretary of State City Collector
1	Renew city business licenses which expired December 31, 1949	City Collector
15	Final payment of 1949 estimated tax by individuals. Last day for filing amended or first estimate for 1949 (or you may file a final 1949 return and pay the tax due.)	Collector of Internal Revenue
15	Illinois Retailers' Occupation Tax return and payment for month of December, 1949	Director of Revenue
31	Quarterly return and payment (by depositary receipts or cash) of income taxes withheld by employers for last quarter of 1949 (Form W-1); must be accompanied by W-3 (annual reconciliation form); also triplicate copies of Form W-2a (withholding receipt)	Collector of Internal Revenue
31	File Employer's Application for Termination of Coverage report, for employers who did not have employment experience in 1948 equal to 6 or more employes for 20 weeks. (Illinois Form UC-1C.) Must be filed prior to February 1, 1950.	Director, Department of Labor
31	Illinois Unemployment Compensation contribution report and payment for fourth quarter of 1949 (Forms UC-3 and UC-40)	Director, Department of Labor
31	Federal Unemployment Compensation Tax for 1949. This tax amounts to .3 of 1% of the 1949 taxable payroll. Tax may be paid quarterly (Form 940)	Collector of Internal Revenue
31	Federal Old Age Benefit Tax for last quarter of 1949, return and payment. (On first $3,000 wages paid; Form SS-1A)	Collector of Internal Revenue
31	Federal Excise Tax return and payment due for December, 1949	Collector of Internal Revenue
31	Employers who withheld more than $100 of income taxes during previous month pay amount withheld to or remittances may be made with quarterly return directly to	Authorized Depositary Collector of Internal Revenue

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In This Issue . . .

There are few businessmen these days who are not genuinely concerned about high operating costs. Recently a great many companies have launched carefully-organized drives aimed at snipping off unnecessary expense wherever it exists. These drives have provided a number of lessons in the technique of successful cost-cutting, which are reviewed by Betty Savesky (p. 13).

Argonne National Laboratory has been popping in and out of the headlines for many months. Yet, few people actually realize the importance of the work that is going on within the barbed-wire installation a few miles southwest of Chicago. This month, Warren L. Anderson takes COMMERCE readers inside for a look at the nation's most important atomic research center. His story begins on page 18.

"What Do Workers Really Think of Management?" (p. 16) is a factual summary of the findings of more than 100 employe opinion polls. These polls were conducted among some 180,000 employes in virtually every field of industry and, collectively, provide first hand evidence of the average worker's attitude toward management on a variety of subjects.

Supersonics is a "hot" subject in industry right now. Technicians by the hundreds have been working with this amazing new source of physical energy contained in high-frequency sound waves. Eugene R. Nelson reports the progress in supersonic research in an article beginning on page 15.

The new book, "Controlling Factors in Economic Development," by Dr. Harold G. Moulton, president of Brookings Institution, has been hailed as "perhaps the broadest and most farsighted look yet taken at the U. S. economy." In it, Dr. Moulton surveys the most important factors that will govern our economy during the next century. As its "Speech Of The Month," COMMERCE presents an address by Dr. Moulton reviewing the highlights of this significant volume.

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The Editor's Page

Idea Gone Wrong

FOR more than a month at this writing, the President's Council of Economic Advisers has been chairmanless. The reason, according to Washington reports, is that the President is having difficulty finding an economist of stature who will accept the post. This seems merely to reaffirm the fact, which was generally acknowledged long before Dr. Nourse made it a matter of public record by resigning in disgust, that the council has been turned into a partisan body. As originally conceived, the council was to be a trio of top economists who confined themselves to impartial technical work. They were to prepare periodic reports for the President on the status of the economy and to advise him as to the economic implications of proposed legislation.

The idea for such a council had much to recommend it. Though not an economist, the President is supposed to have his finger on the economic pulse of the nation. He is also continually called upon to evaluate the economic consequences of legislation. Whether President Truman or Leon Keyserling and John Clark, the two council members who disagreed with Dr. Nourse, were responsible for driving the council into partisan advocacy of proposed legislation is incidental. The damage has been done. Confidence in the council has been impaired and confidence once lost is almost impossible to regain. What was an excellent idea probably has been permanently ruined by very bad execution.

Who Is The Big Bad Wolf?

IF IT has come to their attention, many of the professional friends of small business in Congress and the administration must have been greatly surprised by a study made by the Psychological Corporation of New York. This organization found in an independent survey that a large majority of small businessmen feel their most difficult problems are created by government bureaus rather than large companies. When asked, what group caused them the most difficulty, 58 per cent said government bureaus, 20 per cent named large companies and 20 per cent labor unions.

Perhaps even more interesting is the answer that was given to the question, "Who causes the most difficult competition?" Of the small businessmen queried, 39 per cent said small competitors, while only 32 per cent mentioned big business. Answering the question, "Do big companies do more harm than good?" 64 per cent favored large companies, 13 per cent opposed them.

Collateral light has been shed on the question of bigness in recent testimony before the Celler subcommittee, which was created to enquire into the concentration of economic power in the hands of large corporations. Many presumed that testimony before this congressional group would demonstrate an increasing concentration of power among a decreasing number of giant companies. Actually the testimony showed that corporations now account for about the same percentage of the nation's business that they did 20 years ago, that the 200 largest corporations in the country have been growing at a much slower rate than the next 800 in size, and that the disappearance of small businesses through merger has been very slight—only about one in a thousand—in recent years.

It is not to be expected, of course, that facts such as the foregoing will end appeals to group prejudice intended to pit small businessmen against big business. They should, however, fortify the small businessman against being misled by demagogic statements not based on fact.

Size of itself is not a criterion of goodness or badness, ability or inability to compete, monopoly or lack of it. The real friends of small business realize this. They also know that two of the greatest handicaps to small business are government red tape and a tax burden that makes it difficult if not impossible for small enterprises to obtain capital either from reinvesting earnings or from private investors.

Miner Lewis And 1950

AS 1949 draws to a close, and the forecasters turn their sights on 1950, one of their most optimistic conclusions applies to the outlook for labor peace. Compared with 1949, the expectation is for a great drop in time lost from strikes. That, of course, is relative, for 1949 will go down as the worst year on record except for 1946. It is estimated that more than 50,000,000 man days will have been lost because of strikes by the end of this year, with most of the idle time occurring in the last quarter. The 1946 peak, during the initial postwar convulsion, was 116,000,000 working days.

Optimism for next year is based on the two-year contracts that have been set up as a result of the current year's turmoil. Also, many 1949 strikes yielded such intangible gains that workers' enthusiasm for voluntary layoffs undoubtedly has been dampened for some time to come. So some good may have come from what was a thoroughly damaging situation.

But there is still John Lewis. Every industry is directly or indirectly dependent upon the production of his miners, quite aside from the state of their own labor relations. Thus, the big question as we approach 1950 is whether or not a genuine contract can be negotiated with the doughty John. A contract such as the one that expired last Summer with an "able and willing" clause that allows Lewis to call the miners out whenever he pleases would be no contract at all. To believe otherwise would lead only to a false sense of security.

Alan Sturdy

HERE-THERE and EVERYWHERE

• Executive Quiz-Down — How familiar is top management with the work of each department in a large concern? In an effort to find out, Packard Motor Car Company recently confronted 334 management men with 100-question quiz on company activities. One question asked whether James Ward Packard began making autos because of "(1) a dare from his girl friend, Lydia E. Pinkham; (2) a challenge from Mr. Winton of Winton Auto Co.; (3) a jet propulsion idea; or (4) a contest promoted by Country Gentleman." Although most executives got the right answer (2) on this question, only nine managed to get 89 per cent of all the answers. One often-missed query: the amount of direct taxes represented in the Packard's list price. With answers ranging from $75 to $375, only a few contestants picked the last figure as being right.

• To Receive Is Fun, Too — If you're a businessman accustomed to receiving Christmas gifts from other firms, chances are you will be receiving more presents than ever this year. This calculation is made by Ekco Products Company of Chicago after a survey of department stores and gift-giving concerns which indicates that the total business gift bill this year will run to $96,800,000, up 30 per cent from 1948.

• Big Count Coming — There'll be some unprecedented nose-counting next year when for the first time in history a hemisphere-wide census will be conducted in the Americas. The big count, which is expected to provide government and business with a new store of valuable facts, will gather economic and social data from 22 nations in North, Central and South America. Some 125 foreign statisticians are already working here to standardize the counting in accordance wit U. S. census methods.

• Chicago In Pictures — A photog rapher whose work appears fre quently in COMMERCE is the pu lisher of a unique photographi volume reflecting Chicago at wor and play. "The Chicago Book" b Fred G. Korth fulfills an ambitio that was born 20 years ago whe as a young emigrant from Europe Korth set out to find a pictur book to send back home that woul portray the life of his new city Oddly, he never found exactl what he wanted, so he bought camera and began taking his ow pictures. The result was a success ful career as a photographer. Sinc then, Korth has photographed Chi cago from virtually every angle His 107 most illustrative picture have been combined into the ne volume.

• Payroll Economy — "Operatio Economy, 1950", emphasizing way and means of reducing payrol costs, will be the theme of th Eighth Annual Seminar and Offic Equipment Display to be conducte by the Office Management Associa tion of Chicago at the Steven Hotel from February 27 to Marc 1. Discussion topics will includ (1) better selection and training o employes, (2) supervisory respon sibilities, (3) human relations, (4 better use of the employer welfar dollar, and (5) economy in offic costs.

• More Complications — Busines will conduct its affairs under th guidance and regulation of 28,51 new laws passed by Congress an state legislatures during their 194 sessions, according to a resum prepared by Commerce Clearin House. Legislative bodies were par ticularly active this year, havin

(Continued on page 30)

LOOKING FORWARD

In looking ahead to our 100th anniversary in 1959, Moore, Case, Lyman & Hubbard is continuing to expand its service rather than to rest on its laurels as Chicago's oldest insurance agency.

Capable understudies are being trained so they will be ready to assume positions of responsibility as needed. Thus we are just as eager to assume the challenge of the future with its opportunities and responsibilities as was our founder when he embarked on his new enterprise in 1859.

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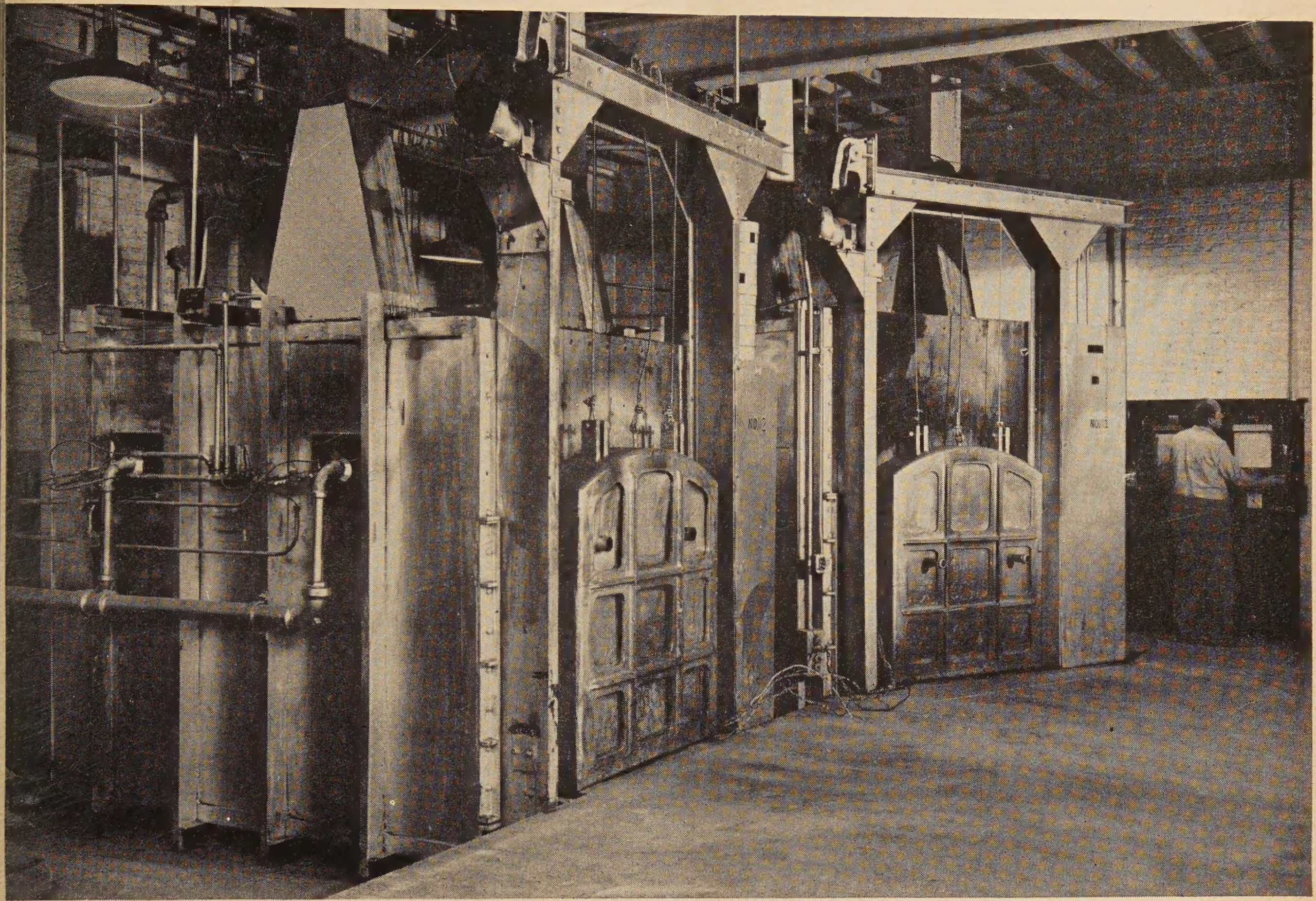
THE USE OF GAS IN BUSINESS

No. 13 OF A SERIES



Two gas-fired annealing furnaces at the plant of the Webster-Chicago Corporation, 3920 W. McLean Avenue, play an important role in the manufacture of precision television parts.

WITH two plants located in this city, the Webster-Chicago Corporation is one of the largest manufacturers of automatic record changers, wire recorders, and television parts in the country.

Working around the clock, seven days a week, two gas-fired furnaces at the company's McLean Avenue plant are annealing millions of precision television parts for its customers. Complete automatic temperature control and minimum maintenance demands have resulted from the use of gas fuel.

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Trends in FINANCE and BUSINESS

Heavy Farm Buying Cuts Asset Holdings

The nation's farmers are in the midst of one of their biggest buying sprees in history, and already it has checked one of the most persistent economic trends of the decade. Exceptionally high spending to improve both farm plants and homes last year resulted in the first decline in farmers' ownership of liquid assets since such figures were first compiled in 1940.

The decline, however, amounted to only $300,000,000 for the year, according to the Department of Agriculture, and farmers' combined holdings of liquid assets on January 1, 1949, amounting to $19,800,000,000, were still nearly five times the total owned at the beginning of 1940.

« « » »

Working Wives Boost Average Family Income

Some highly illuminating facts regarding average family income in the Chicago area have been brought to light in a preview of the 1950 census conducted by the Community Inventory of the University of Chicago and the U. S. Census Bureau. The pre-check, based upon a scientifically selected sample of about 3,700 households, indicates that the average income of Chicago area families last year was a prosperous $4,200. This high average was partly made possible by the fact that about half of all Chicago metropolitan area families had two or more breadwinners last year.

Among other findings of the survey were these facts: (1) 94,000 families (6.4 per cent of the total) in the Chicago metropolitan area received an income of $10,000 or more in 1948; (2) two out of every three persons 14 years of age or over were earners, and they averaged $2,600 in income; (3) the average income of one-earner families was $3,600, the average for families with two earners was $4,700, and for families with three or more earners, $7,500.

Census officials said that increased employment of wives of family members was a strong factor in the high average income last year.

« « » »

Britain Seen Threatening U.S. Air Supremacy

American transport planes will soon lose the worldwide supremacy wich they have possessed since long before the war. This prediction comes from Dr. John T. Rettaliata, dean of engineering at Illinois Institute of Technology, who adds that Britain with new gas turbine and jet airliners is rapidly winning its bid for universal air leadership.

Many of America's latest piston engine commercial aircraft are already obsolete, according to Dr. Rettaliata. In the civil aircraft field, he warns, America is repeating the same mistake made during the war in military aircraft, when we permitted the British to conduct the development work on jet engines while our facilities and engineering talent were used for the mass production of conventional piston engines.

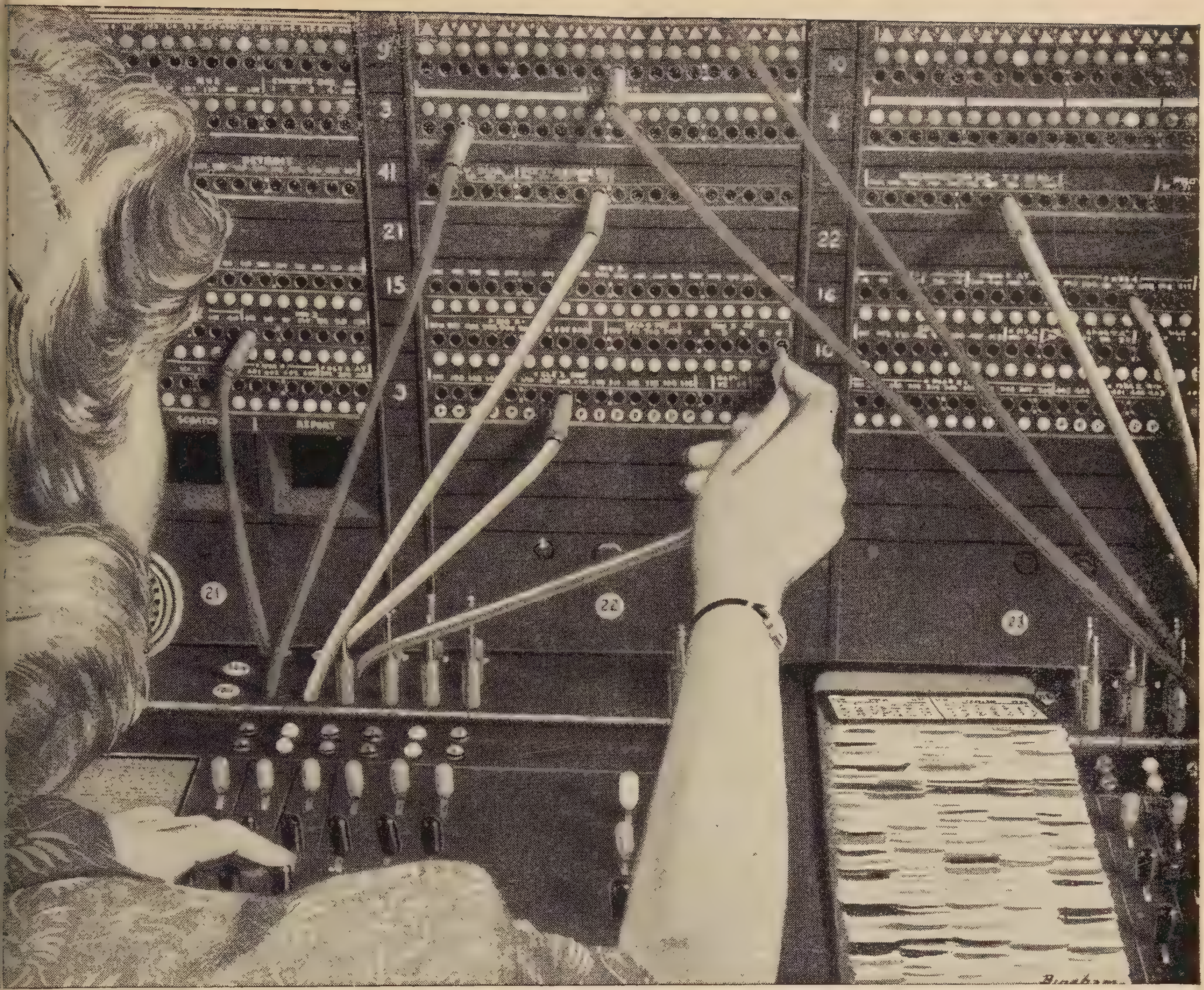
« « » »

Six States Enact New Tax Laws

A new trend in state legislation makes it easier to collect state taxes outside the state imposing them from the taxpayer who moves away or who owns property in another state, according to Commerce Clearing House.

New laws in six states, according to CCH, provide that the taxpayer who moves out of his state and leaves behind unpaid taxes

(Continued on page 36)



What's the connection?

To give you good service, your Bell Telephone company must have good switchboards, cables, telephones, and literally thousands of different types of equipment. Each must be *designed,* then *manufactured,* so that all can *operate* together perfectly in carrying your voice quickly and clearly across the street or across the nation.

Do you know Western Electric's connection with all this? For sixty-seven years, we have been the manufacturing unit of the Bell System. This has assured a dependable source of good equipment—efficiently and economically produced to meet the needs of telephone users.

- **As members of the Bell System, Western Electric people who *make* equipment, Bell research people who *design* it and Bell Telephone company people who *operate* it all work together with one aim: Good telephone service for you at the lowest possible cost.**

Western Electric

BELL SYSTEM

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7571
PRESS SHOP

Operation Cost-Cutting

By Betty Savesky

A Detailed Report On Cost-Cutting Drives By Scores Of Companies; Some Techniques Used And The Results

RECENTLY a number of business concerns have been seized with a mischievous financial ailment which leaves its victims looking hale and hearty on the outside and virtually paralyzed on the inside. Take, for example, the case of the furniture manufacturer who, while enjoying a robust $13,000,000 in annual sales volume, was nevertheless suffering a net loss of $900,000. Management consultants had no trouble in diagnosing the source of trouble: excessive cost leaks in almost every area of the firm's operations. Their prescribed remedy—tight-fisted budget control for all company divisions — was followed scrupulously and in the following year the deficit was converted into an $800,000 profit.

Variations of this battle against excessive operating costs have become increasingly common throughout industry. With break-even points higher than ever and selling prices facing downward pressure from both competition and buyers, business generally has given top priority to its drive against unnecessary expense.

The implications of the battle were enunciated a few weeks ago by President J. C. Coleman of Burroughs Adding Machine Company. Both variable and fixed costs, he declared, have risen to "alarming heights;" today they threaten the very existence of both big and little companies across the country.

← This eerie mechanism is a cost-cutting "iron hand" that does two men's jobs by snatching pressed parts from furnace onto chain-type transfer table
Ford Motor Co. Photo

Economy Plans Varied

Diligent cost-cutting campaigns began, of course, many months ago; their inception coincided roughly with the end of seller market conditions in one line of business after another. Hence, many managements already have a sizeable amount of cost-cutting experience under their belts. Their efforts have followed no consistent pattern. Some were reasonably successful from the outset, others have made numerous missteps before discovering the exact areas of corporate extravagance.

Many companies have sought the help of management consultants; a trend, incidentally, which has brought this profession a wave of unprecedented prosperity. Other managements have preferred to handle the job within the framework of their own organization, the most common procedure being to assign a cross-section of top personnel to cost-reducing committees. Such committees have usually been given discretionary power to act promptly upon their own remedial suggestions.

The in-company economy strategy at the Crosley Division of Avco Corporation is a good example of the committee system in operation. Here, four committees have been established on a product basis. Each includes the product manager, project engineer, director of purchases, manager of the service department, director of materials control, works manager and a sales department representative. The specific goal of these committees is to improve Crosley products without raising manufacturing costs.

Crosley's office procedures committee, for example, has been bearing down upon duplication of forms and other useless red tape. Pinpointing its attack, it found that on the average eight individual steps were involved in filling an order. By eliminating three steps the office force was able to omit 12,000 unnecessary documents a month for a substantial saving in time, paper and manpower.

Among other companies currently using the committee technique are Allis-Chalmers Manufacturing Company, Westinghouse Electric Company and Goodyear Tire and Rubber Company. As might be expected, each company organizes its cost-cutting committees differently. Some are organized on a division basis, others are set up on a plant-by-plant basis, still others (like those at Crosley) are established for each general line of products. In almost all cases, however, an attempt is made to have the committees represent every phase of company operations.

$2 Million Saved

At one Allis-Chalmers plant in Milwaukee, a 15-member committee representing sales engineering, mechanical engineering, production, time study and the plant's work force meets weekly. One of its cost-cutting recommendations called for a new method for machine-taping coils, an innovation which has since cut the cost of the operation by 50 per cent.

At Westinghouse, where committees operate on a divisional basis, one — the appliance division committee — effected close to $2,000,000 in savings in the first half of this year.

Curiously enough, one of the hardest economy jobs for the average company is to find where opportunities for cost reduction actually lie. Experience has shown that top management often has been unable to discern, in advance, which costs are excessive and which costs seem to be excessive, but actually are not. Hence, time is wasted trying to reduce costs which are really more or less fixed.

CHECK-LIST FOR ECONOMY

There is no easy remedy for high operating costs. Hidden expenses, inefficiencies and waste vary greatly from company to company. Here, however, is a check-list of questions that can serve as a starter for any company planning a cost-reduction program. The questionnaire is based on interviews with a number of leading management consultants.

ADMINISTRATION

1. **Is responsibility well defined so that management has real teamwork?**
2. **Is company top-heavy with high-salaried men, some of whom do not pull their own weight in the operation?**
3. **Is sales planning and production scheduling well coordinated?**
4. **Are office procedures efficient or does useless duplication exist?**
5. **Are labor-saving machines (automatic tabulators, mailing machines, etc.) used where possible?**
6. **Are purchases made at the lowest cost consistent with quality?**

PRODUCTION

1. **Are physical facilities maintained in top operating condition?**
2. **Are production hours lost because of maintenance bottlenecks?**
3. **Are machines used that are past peak efficiency, sapping productivity?**
4. **Does the plant layout afford efficient flow of materials and production?**
5. **Are materials handled manually or by modern, efficient methods?**
6. **Are quality controls employed to reduce rejects, scrap and reworks?**
7. **Are unit labor costs satisfactory compared to total-industry levels?**
8. **Has a wage incentive plan been tried to boost productivity?**
9. **Are employe policies conducive to good labor-management relations?**

DISTRIBUTION

1. **Is too much selling time and effort being expended on low profit items in the product line or on smaller, unprofitable accounts?**
2. **Is selling effort being spread over too wide an area?**
3. **Is advertising producing satisfactory sales in relation to cost?**
4. **Are products being transported as economically as possible?**
5. **Are there items in the line that should be dropped or redesigned?**

FINANCIAL

1. **Would better production planning level out peak demands for working capital beyond the company's cash resources?**
2. **Has over-extension of inventories tied up capital unnecessarily?**
3. **Can long-term fixed debts be refunded at lower interest rates?**
4. **Would investment in more suitable facilities mean long-term savings?**

A typical case concerns the president of a building materials manufacturing company who got thinking one day that costs were particularly high in one division of his company. He decided therefore that $100,000 should be lopped off operating expenses of the division, which was then grossing $2,000,000.

Realizing that his labor costs had risen considerably in the last decade, the company president decided that a cut in payrolls was the logical route to economy. But he forgot one thing: to achieve this goal he would have had to slash his direct labor unit cost by more than 50 per cent. His mistaken assumption became even more apparent when an outside consultant pointed out that his real leakage was in purchasing and procurement. These operations accounted for well over 50 per cent of his cost dollar, while direct labor composed only 10 per cent.

By analyzing procurement needs and setting up long term purchasing plans with suppliers, the firm was subsequently able to accomplish the $100,000 savings. Careful cost studies showed, for example, that some materials could be downgraded without lowering the quality of the finished product. Other economies came by fixing more exact specifications for purchased materials, thereby making it possible to eliminate certain processing steps.

An unusual case? Management consultants probably would say "No." According to the professional cost-cutters, industry abounds with company managements which are uncertain as to where to look for extravagance.

Fixed Means Fixed!

For one thing, they say, labor costs — though up sharply from a decade ago — remain a relatively inflexible budget item. The reason, of course, is unionization and industry-wide bargaining. The railroads are a good example; here, labor costs comprise approximately 64 per cent of operating expense, yet there is little that individual management can do since wage rates are set by industry-wide bargaining.

Management, however, is not completely without economy tools in the matter of labor costs. Unit labor costs, as distinguished from

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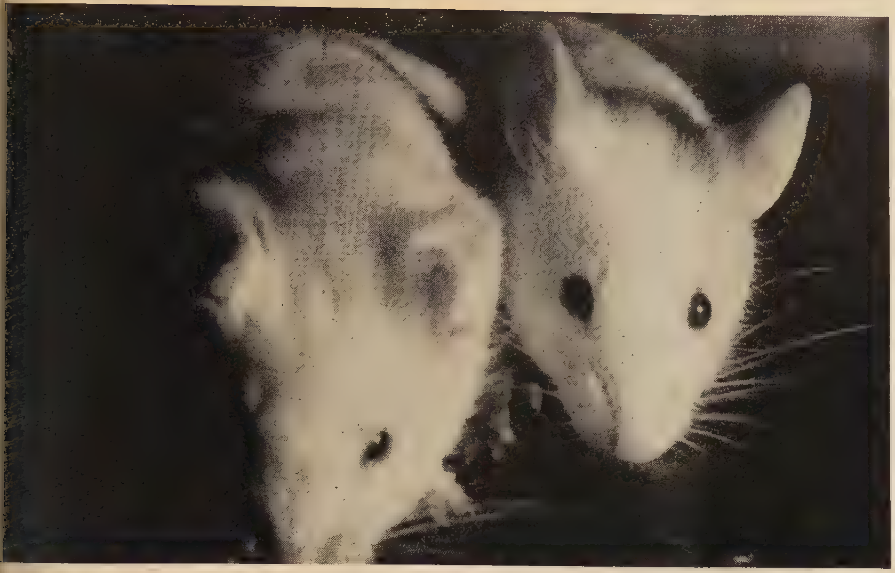
Danger, Silent Sound At Work!



Powerful waves from ultrasonic siren shrivelled ears of mouse on left

Ultrasonic Wonderland: Sound Waves That Man Can't Hear Are Proving A Potent Industrial Tool

By EUGENE W. NELSON

FOR a good many years, the word "noise" has had a distasteful connotation to industry. To spare the nerves of its workers, business has been spending sizeable amounts of money to make machines and factories less noisy. Now, thanks to science, noise has suddenly become an industrial asset, and probably more money than ever will be spent to produce noise rather than obliterate it.

This happy contradiction arises from the fact that noise has a number of astonishing talents. If you can get a noise to behave just right, it will wash your clothes or de-grease a piece of metal or clear away a fog or spot a bubble in a metal casting.

The secret behind these strange characteristics of noise involves a field of research called "ultrasonics," which jumped into prominence during the war. Ultrasonics enabled surface vessels to spy out enemy submarines by merely shooting a noise into the water. The sound, traveling in waves, bounced through the water until it struck metal, then reverberated back again to report exactly where the target lay.

Tear Apart Compounds

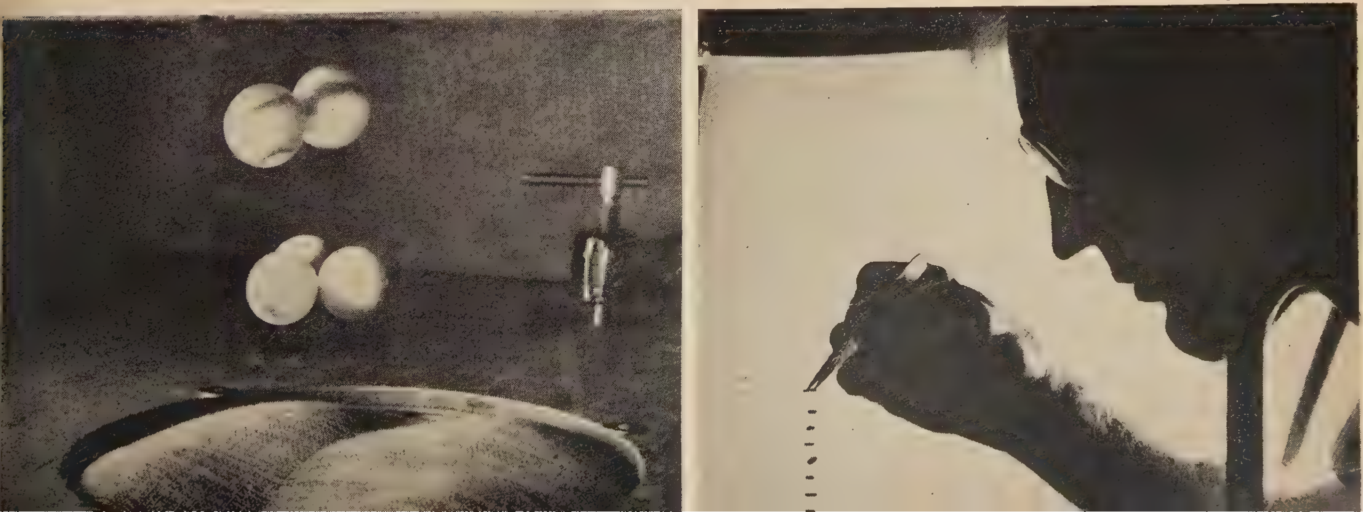
Actually, sound is nothing more than a series of pressure pulsations. It is this physical energy of sound that is now being put to work. High-frequency, high-power sound waves can be made to act like a gigantic agitator. Called "ultrasonic" because they travel too fast for the human ear to detect—such waves will literally tear apart some compounds; others, they will mix more thoroughly than is practical by conventional methods.

One advantage of a sound wave is that it is reflected by all "barrier surfaces." Hence, if a sound wave starts out in metal, it will travel to the opposite surface, meet air, and be reflected back to its starting point. By timing the round trip, the thickness of metal can be measured with great accuracy. But, more important, if there are cracks or air bubbles in the metal, they act as barrier surfaces and reflect back some waves. It is in this manner that sound waves can be

(Continued on page 23)

(Left) 3600-cycle sound waves support marbles in mid-air. (Right) Bits of cork ride center of counterbalancing waves.

Photos from Steelways



Korth photo

What Do Workers *Really* Think of Management?

By ROBERT N. McMURRY

THE American working man, in almost every field of endeavor, enjoys high wages, seniority, pension systems, paid vacations, a variety of insurance programs and relatively short working hours. In many cases, he enjoys special benefits like industrial cafeterias with bargain-priced food, cut-rate prices on company products, and extra pay for overtime work. Despite these benefits, a great many American workers feel a greater sense of loyalty to a union than to their own managements. Their sentiments toward management and toward the private enterprise system as a whole are often luke warm at best and outright resentful at worst.

This is not a curbstone opinion. It grows out of 127 employe opinion polls made by our company for managements in virtually every industry and covering some 180,000 workers and 20,000 supervisors and management personnel. These morale surveys, desired by managements for various reasons, have disclosed many facts regarding labor's attitude toward employers, as well as managements basic attitudes toward labor. Often these attitudes go far below the level of conscious thought; their roots lie in subconscious emotional feelings which are behind conscious behavior.

Probably the outstanding finding of this long series of polls can be boiled down to one sentence: the average American worker possesses only a very slight feeling of identity with management; to him, the mutuality of their interests and objectives is largely unrecognized.

"Distance" Resented

In thousands of cases, rank and file workers have revealed their resentment of the "distances" between themselves and those above them in the industrial hierarchy. They feel that they are regarded as little more than a number in a department, whereas supervisory personnel have names, usually beginning with "Mr." This status distance is irksome to most workers.

Foremen and supervisors often attend training courses and, however good this practice is, it tends to create a further educational distance between foremen and worker, because similar opportunities are not available to the worker. Polls have shown that the average worker feels he had trouble enough getting his original bare education, and now top management is little interested in helping him improve, even if he is energetic enough to take advantage of extra-curricular training.

Since many of the men above the foreman level have college or technical school educations, most workers sense an educational ceiling over their heads, one through which they have no chance of breaking.

There is also the question of economic distance. Incomes rise as status and educational distances increase, and the worker resents the fact that he is forced to receive the least amount of money with little or no hope of ever receiving considerably more. Very careful polling and follow-up interviewing have further shown that a specific dollar-and-cents goal is not so much the problem. What the worker resents most is that many of the opportunities for moving upward have vanished. The skilled tool maker's job, for example, has been dissected, analyzed and broken down into its constituent operations. What was once true craftsmanship has in many cases become a series of semi-skilled jobs, none of which carries notable prestige. Some semi-skills, such as machine tending, can even be handled by women! Six out of ten assembly-line workers feel this sense of occupational frustration; they speak of the repetitiveness of their work, the emptiness of their jobs and their disinterest in a small, subdivided, semi-skilled operation which offers no avenue for growth.

Unlike Attitudes

This feeling points up a basic difference in the attitudes of worker and manager toward the company's welfare and its goals. The worker's attitude ranges from indifference to animosity, because with his time and energy largely given over to earning the necessities of life, he feels that only dreamers expect to achieve greater skills, higher jobs and more pay.

As a result, the average worker has no positive identification with company or management, nothing which attracts him or holds his loyalty. Eighty per cent of the workers interviewed have reflected some of these dissatisfactions with their industrial life, and 30 per cent have reflected all of them.

Feel "Expendable"

These dissatisfactions, it may be noted, are all negative; they indicate why the worker is not attracted to management. In addition, however, workers have indicated a number of positive reasons.

Being in a semi-skilled or unskilled role, the worker's security is usually in the hands of a supervisor; when business slows up, he is "expendable." Also company policy often implies that he is an inferior. For example, the average worker ordinarily is not permitted to eat in the same cafeteria with supervisors; he must work in surroundings which comparatively are often unattractive.

Finally, he feels that he has no rights in determining company policy, except insofar as any written suggestion dropped into a box may affect some minor operation. Company policies, for the most part, are announced to him as accomplished facts; there is little he personally can do about them. He may venture a guarded criticism to his immediate superior, but only if he is on good terms with him.

Unfortunately, most companies are not fully aware of their employes' attitudes; nor have they made much effort to uncover those feelings. There are, of course, exceptions, but in the great majority of cases, the average worker has no clear channels of communication with top management. There is no doubt in his mind that he receives management's viewpoint, via bulletin boards, company publications, and daily instructions, which flow from front office down. But who or what carries the worker's opinion up to the front office?

Frustration Causes

Members of management's lower echelons lack incentive to carry upward anything which might be damaging to them — at least, so most workers believe. Since supervisors get no reward for accurately reflecting employes' attitudes, unless they are in accord with company policy, opinion — like water — seems to flow down-hill only.

How does the average worker resolve these feelings of frustration? Everyone, to some measure, "takes out" frustrations upon subordinates, but the worker, being on the bottom of the heap, has no one on whom to vent his dissatisfac-

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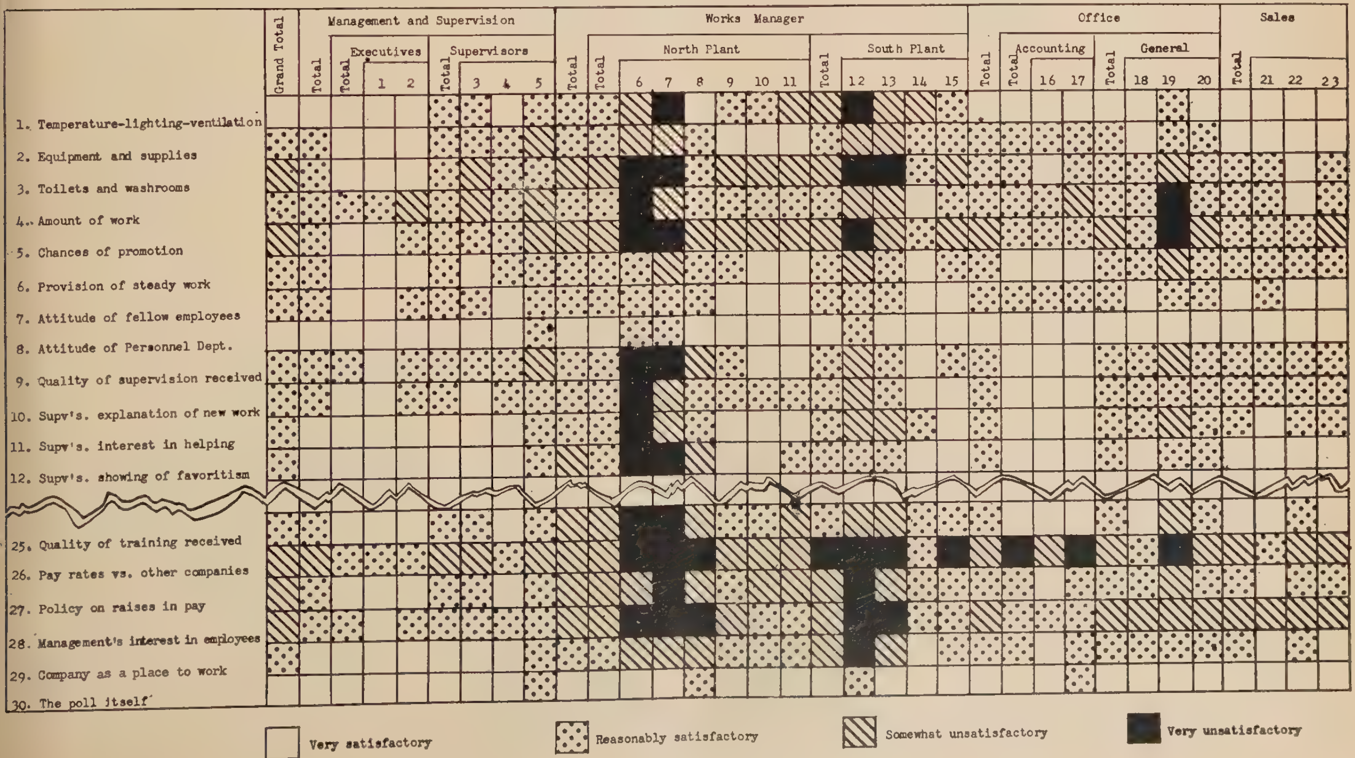


In one company, employe opinions on many matters were charted on a departmental and cumulative basis.

Mighty Argonne

Acme

In Chicago's Backyard, The World's Greatest Research Center Probes An Unknown World

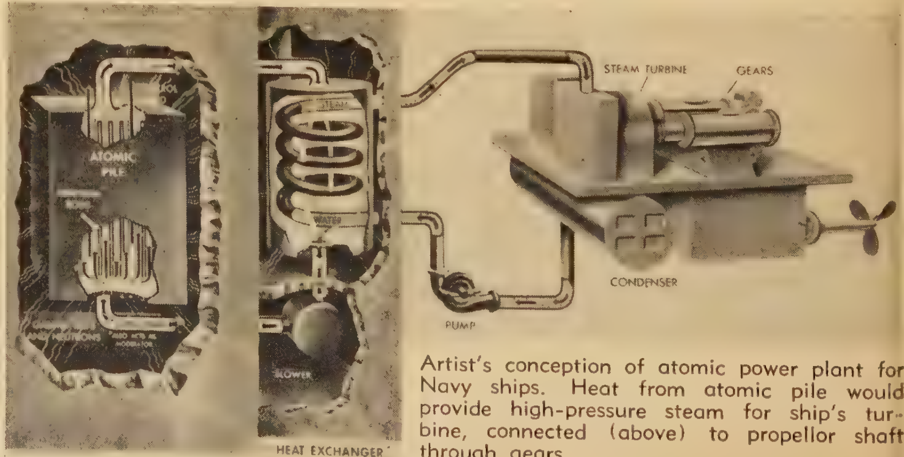
By WARREN L. ANDERSON

A SUNDAY afternoon driver motoring along Illinois Route 83 might never notice an unprepossessing group of buildings partly hidden in the woods 25 miles southwest of Chicago's Loop. If he noticed them at all, he would probably mistake the rows of secluded Quonset huts and high fences topped with barbed wire for a military base. Yet, for all its G. I. look, this 3,733-acre installation is the world's leading atomic research center. It is called the Argonne National Laboratory and upon it rests to a large degree the future security of the American people.

Actually, the similarity of Argonne to an Army camp is superficial. Its only uniformed personnel are the armed guards who wear policeman grey, not army khaki. The majority of the 1,200 men and women working within its eight acres of buildings are technicians and office employes. Several hundred key workers, however, are top-flight scientists and engineers whose unique job is one of the nation's most closely guarded secrets.

Among other things, the job is to provide answers to these questions: Can we harness the almost incomprehensible energy of nuclear fission? Can we create useful power from the most devastating reaction that man has yet discovered? Can we create that power economically and safely? Can we devise a workable defense against the explosive reaction if it is directed against us in wartime?

These and a host of other questions are the real reasons for our being in one of the costliest enterprises in history. The Atomic Energy Commission, boss of the Argonne, already owns $3,000,000,000 worth of buildings and real estate, and maintains 1,270 factories, laboratories and offices in 41 states. Di-



Artist's conception of atomic power plant for Navy ships. Heat from atomic pile would provide high-pressure steam for ship's turbine, connected (above) to propellor shaft through gears.

rectly or indirectly, the program employs 68,000 people.

Argonne Laboratory, which is operated for the Commission by the University of Chicago, is the actual grandsire of this gigantic operation. It was, however, brought into being only seven years ago as the university's "Metallurgical Laboratory." It was here that physicists achieved "the first self-sustaining chain reaction and thereby initiated the controlled release of nuclear energy," to quote from the bronze placque which marks the spot where the atomic era was born.

Today, Argonne's role in the overall atomic energy program is based partially upon its researches into the physical and life sciences, more specifically upon its being the center of the nation's reactor development program. Both phases of its job rest upon one fundamental reaction: the splitting of uranium 235. It is from this naturally occurring phenomenon, one for which scientists had all of the basic facts a decade ago, that atom bombs, plans for uranium power units, possible cancer cures and the previously-unexplorable mysteries of life itself actually originate.

How The Atom Splits

The principle of the atom-splitting process is not difficult to comprehend. A single atom of uranium 235 can be imagined as a common paper bag containing a mixture of highly explosive gun powder and bullets — the bullets representing neutrons within the atom, the powder representing the remainder of its structure.

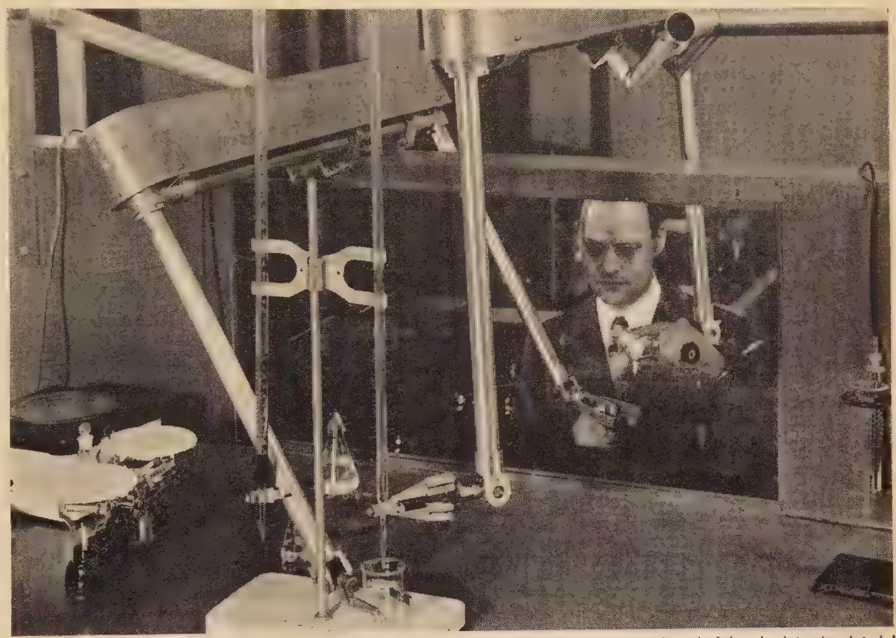
Suddenly, a stray bullet or neutron strikes the powder-bullet mixture, becomes a part of it, and creates an atom of uranium 236, heavier by one neutron than uranium 235. Since uranium 236 is extremely unstable, it explodes millionths of a second later into two nearly equal halves. In this atom-splitting process, tremendous amounts of energy are released. But, more important, additional neutrons, are set free and if other atoms of uranium 235 are nearby, these newly freed neutrons may, under certain conditions, join with and split them too. If allowed to continue, this becomes an uncontrolled chain reaction, the basic reaction of an atom bomb.

Argonne's job is to design machinery to harness and control this reaction so that it will produce useful power rather than an explosion. This is where the reactor comes into the picture. A nuclear reactor is a block of concrete shielding about the size of a small house enclosing a lattice-work of uranium bars comprising a natural mixture of uranium 235 and uranium 238. The reactor also contains control rods, cadmium bars that soak up excess neutrons and insure uniform operation of the pile.

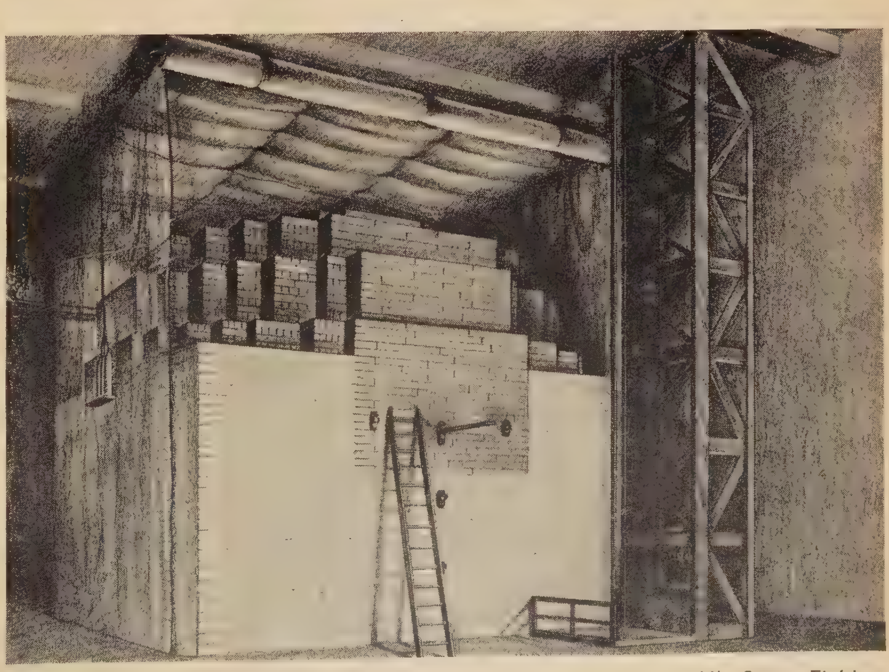
When a reactor is started, the control rods are withdrawn for a few seconds. The chain reaction starts and neutrons are released from uranium fissions. Heat is produced and the control rods are reinserted to a position that will allow only a given number of neutrons to continue producing additional fissions.

Huge Power Potential

The power potential in such a system is tremendous. Argonne physicists calculate that one pound of fissionable fuel contains the equivalent kilowatthours of energy of 1300 tons of coal. Already they can outline a power plant that will utilize this fuel, but as yet they have been unable to overcome a number of problems that must be solved be-



Argonne's "master-slave" manipulator handles "hot" materials deftly behind shield



Birthplace of the atomic age: first nuclear reactor at Chicago U's Stagg Field fore such a plant can be built. Many of these problems concern the fantastic amounts of heat that are suddenly released when atoms are split.

The power problem at Argonne is one of collecting the heat so that it can be converted to power. This calls for wholly new and different equipment, materials that can withstand thousands of degrees of heat, and pipes that will not break down under newly developed coolants.

As a practical step toward solving the power problem, Argonne scientists are now designing a nuclear furnace for the Navy. It will be a prototype of a ship's engine and will be built by the Westinghouse Electric Corporation.

Using highly refined uranium as fuel, the power plant will operate at 50,000 to 60,000 kilowatts and at ultra-high temperatures. A special fluid will pick up heat from the reactor and then cascade over a water-filled coil, converting the water to steam. The steam, in turn, will operate a turbine connected to a generator and the generator will power the driving motors.

The reactor's most probable use will be in a submarine. One charge of fissionable fuel could drive a subsurface ship tens of thousands of miles. Surfacing to re-charge batteries would be unnecesary because no battteries would be needed.

The cost of the initial power project will be in the neighborhood of $30,000,000. It will, however, be neither the final step in naval power plants nor the answer to civilian power shortages.

Secrecy Screen

Industrially the Argonne is loaded with potentialities, but because it does not market radioactive isotopes and will not tackle a specific industrial problem unless it is directly concerned with nuclear energy, most of its technological efforts are hush-hush projects. Even suppliers often have no way of knowing on what machinery or apparatus their product is being used.

There are, of course, some exceptions to this secrecy policy. Some months ago a West Coast research institute sent a collection of piston rings to the laboratory to be radioactivated. Later installed in a motor, the wear of the rings is now being determined by measuring the amount of radioactive iron in the engine's oil after a test run. This work may lead to improved alloys.

"Master-Slave"

Another industrial prospect to come out of Argonne is an AEC-patented "master-slave" manipulator. A mechanism of bars, semi-universal joints and claw-like hands, which now handles "hot" isotopes by remote control, the device may have numerous applications in industries where hard-to-handle chemicals and corrosives are used. Several companies are now licensed to manufacture the manipulator.

ANOTHER ARGONNE FIRST!

A mere breath before the December COMMERCE went to press, the Atomic Energy Commission lifted the wraps from a development, hitherto stamped "secret." The brief, but highly significant, announcement — that Argonne National Laboratory had developed an experimental "breeder" furnace — indicated that AEC had licked one of its toughest problems: the difficulty of producing adequate amounts of uranium 235.

Fissionable uranium 235 — the core of the atom bomb — is scarce, expensive to recover. Now, however, Argonne has devised a furnace to convert more plentiful (but non-splitting) uranium 238 into fissionable uranium 235. The furnace would also pave the way for using thorium ("Atomic Understudy" — COMMERCE, Sept., 1949) for atomic energy and bombs. The latter is three times more common than all forms of uranium combined.

On the biological and medical side, Argonne has released more data than in any other phase of its work. Much comes from the Radiobiological Experiment Station which has been exploring a number of medical and chemical riddles with radioactive isotopes. In one important field, the experiment station is undertaking to duplicate the process by which a plant converts sunlight, water, air and certain elements into foodstuffs. If successful, the accomplishment will mark a big step forward toward an adequate world food supply.

This type of research will also lead to a better understanding of how specific foods function in the body. It may well answer such questions as: how are enzymes formed from amino acids? What part do little-understood elements like cobalt and manganese play in nutrition? Why are some people fat, others thin? Is cancer related to nutrition?

Another top-priority research problem at Argonne carries fearful significance for everyone living in what might ultimately be an atomic warfare target. It is devoted to the study of radiation sickness, as caused either by exposure to an atom blast or by working with radioactive isotopes. Dr. Harvey M. Pratt and his Argonne associates have only recently found that animals can be protected from death resulting from lethal X-ray exposure if previously treated with cysteine. This is an inexpensive amino acid which protects animals when given orally or intravenously an hour before exposure. This important discovery, Argonne experts say, may provide important clues to the nature of radiation damage and its treatment.

To amplify their knowledge, Argonne scientists have studied the effects of radiation on blood circulating in the tissue paper-thin wing of a bat. Since this peculiar bit of anatomy is roughly one-thousandth of an inch thick, investigators could observe blood changes directly with a microscope. They found that after the bat was exposed to radiation, the circulation of the blood slowed down, largely because broken cells and other organic debris clogged the capillary blood vessels. When the vessels were completely clogged, the bat died.

Radiation Study

They have also studied the causes of hemorrhages in acute radiation cases and found that a substance like heparin, one that normally prevents blood from clotting in the blood vessels, increased after radiation and contributed to bleeding.

Two chemicals, toluidine blue and protamine, were found to check bleeding by neutralizing that substance.

Argonne scientists are also trying to discover why radiation produces cancer or other types of injury to the cells of the body. Experimenters are irradiating normal chemicals of the body to find whether they form cancer-producing chemicals. They

(Continued on page 40)

The Next 100 Years: Our Richest Yet?

A Distinguished Economist Cites Five Factors That Govern America's Future Economic Development

IN THE last two decades grave doubts have been raised as to the economic future of the United States. Three essentially different lines of thought have contributed to the pervading pessimism of our time. The first is the conception that we have reached the age of economic maturity, and are thus approaching a stationary society; the second is that we have so wasted our national patrimony as to undermine the foundations of industrialism; and the third is that the growth of government power and controls is destroying the incentives to progress under private enterprise without providing feasible substitutes.

The mature economy theory is readily disproved. In the first place, those who a decade ago so confidently predicted a steadily declining rate of population growth leading to a stationary population by about 1980 have been confounded by the population trend of the forties. Not only during the war and the early postwar years did population increase at a very rapid rate, but there has been no abatement to the present moment. This vast upsurge in the birth rate will project its influence forward over a long period of years. In the second place, studies of family expenditures at different levels of income conclusively show that consumer desires are strong rather than weak — that aggregate consumptive demand is capable of indefinite expansion. While the percentage saved naturally increases as incomes rise and provide a savings margin, aggregate expenditures nevertheless increase in all the income brackets and especially in the lower levels. The unfulfilled desires of the masses of the population provide the essential foundation for an almost limitless economic expansion.

The issue as to the adequacy of our natural resources is more complicated. It involves a comprehensive analysis of the nature of our future requirements, the state of our natural resources and future possibilities in the realm of technology. My intensive studies lead to the conclusion that we do possess resources adequate to permit a doubling of the population over the next century and an eight-fold rise in living standards.

Foundations for Progress

The United States thus still possesses the essential foundations for a vast further rise in living standards. Rich natural resources and continuing advances in the realm of science, technology, and business organization, could make the century ahead even richer than the extraordinary century which lies behind us. We have not as yet undermined the foundations of industrial progress. We have not reached an age of maturity, at which attrition and senility inevitably impend. On the contrary, this is still a blessed land—both in terms of physical resources and scientific and organizing genius.

SPEECH OF THE MONTH

Made before the American Management Association, November 10, 1949

Harold G. Moulton *Acme*

By **HAROLD G. MOULTON**
President, Brookings Institution

What are the requirements for the realization of our vast economic potentialities? That is, what policies are essential? The lessons of history and economic analysis suggest the following basic requirements.

First, we must give unceasing attention to the conservation of our natural endowments. The constructive efforts already being made in this direction must be strengthened in every possible way—by private as well as public policies.

Sound Fiscal Policy

Second, we must maintain a sound fiscal situation. Continuous government deficits will in due course inevitably sap the very vitals of the private enterprise system, destroying the essential stimuli or incentives to progress. On the supply side, the mounting tax load will progressively reduce the volume of equity money available for capital expansion. On the demand side, the incentive to risk capital in pioneering ventures will be undermined. And when expansion of private enterprise ceases to furnish adequate employment the government feels impelled to take up the slack by expanding public enterprises. Since public enterprises are seldom self-supporting the fiscal situation is still further undermined.

Third, we must maintain a stable monetary unit. History proves conclusively that without a sound currency system it is impossible for long to maintain a stable economic system or a stable fiscal situation.

Fourth, increasing productivity constitutes the foundation for higher standards of living. That is, it is technological advancement, which provides the increasing per capita supply of goods and services. Maximum increase in productivity necessitates: (1) a constant expansion of scientific research and engineering experimentation; (2) an ever broadening mechanization of every type of economic activity; (3) the rapid replacement of obsolete plant and equipment; (4) the further improvement of internal organization and management policies; and (5) the cooperation of labor.

I place especial stress upon labor performance because in recent years it has seriously limited the possibilities of higher standards of living. The fact appears to be that the efficiency gains from technological improvements have been offset in substantial measure by a persistent decrease in individual labor efficiency. If technological progress were matched by a corresponding improvement in labor performance the rate of progress would be very greatly increased.

Mass Buying Power

Fifth, business policy must promote a constantly broadening distribution of national purchasing power. If markets are to be found for the products of an expanding industry, the people whose needs are greatest must be able to buy the goods they desire. In short, the buying power of the consuming masses must move forward step by step with the producing power of our mass production industries. This requires a constant passing along of the benefits of technological progress to the consuming public.

I emphasize this broadening distribution of income because it is the heart of the problem of business management. Unless the buying power of the masses, whose wants create markets, is progressively expanded business management will have to be content with a virtually static situation. There is scant future in trying to sell more goods to the shrinking rich and middle classes.

Wages and Prices

Before the advent of labor organization, wages were determined by demand and supply, and prices, with a few exceptions, were governed by competition. Hence the free enterprise system was supposed automatically to reduce prices in line with costs and thus to broaden the buying power of the masses. Today labor power, with the support of government, is strong enough to garner all — or more than all — of the benefits of technological progress through the medium of higher money wages. Thus the possibility of reducing prices is limited, and often destroyed.

What difference does it make whether the method of enhancing mass buying power is higher money wages or lower commodity prices. The difference, in fact, is vital, because the money wage increase method does not correspondingly generate increased demands and sustain employment.

Let us assume that in a given manufacturing establishment productivity has increased by 10 per cent, and that in consequence the same volume of output can henceforth be produced with 1,000 fewer workers. The discharge of 1,000 workers no longer needed would mean a pay-roll saving of say, $1,000,000 a year. By hypothesis this sum is added to the wages of those remaining in employment. Would this process generate a general increase in purchasing power?

The arithmetic is that a plus one million in purchasing power (in the hands of the employed laborers) is exactly offset by a minus million of purchasing power (in the hands of the discharged laborers). The increasing productivity thus furnishes no net addition to the national purchasing power. It will be noted also that the money costs of production are not lowered, since the economies resulting from the decrease in labor are completely absorbed in raising the wages of those who continue to be employed. Since total purchasing power is not increased, no new employment either in this industry or in other industries has been generated as a result of the increase in productive efficiency.

Unwise Pricing

In summary, this process results as follows: (1) Total wage disbursements remain unchanged; (2) prices remain unchanged; (3) the volume of output remains stationary; (4) the national income remains unchanged; and (5) the volume of employment decreases. All that has happened is that employed labor has gained at the expense of those displaced.

Where wage agreements are consummated on an industry-wide basis and horizontal increases are called for, the process is further complicated. There are wide variations in the efficiency status of individual plants, and the more efficient may be able to pay the added wages, while the less efficient cannot. When this is the case, prices are

(Continued on page 34)

"Correct procedure or no, Miss Haskins, I hardly think International Steel is going to bow to Mudville Business College textbook No. 3!"

Danger, Silent Sound At Work!

(Continued from page 15)

used to detect flaws that are hidden so deeply that even X-rays cannot penetrate to them.

To put sound to work on an industrial scale, it is necessary to produce frequencies of well over 30,000 cycles per second (humans detect sounds only in the 500-18,000 cycle range). At present, there are three major types of units which produce these ultra-high frequencies. One type, the siren, uses air at high pressures to produce high-frequency vibrations. The other two use electrical energy; one transforming this energy into mechanical vibrations by means of a quartz crystal, the other by means of a metal rod.

New Sound Maker

One promising device for the production of ultrasonic vibrations was developed recently at the General Electric laboratories at Schenectady. It consists of two small sections of steel tubing, each two inches long, one sliding within the other like a piston. A continuous stream of compressed air is sent into the whistle through a narrow rubber hose. It leaves through an aperture whose size determines the speed of the sound waves. A sheet metal reflector, some 30 inches wide, is used to focus the sound waves to obtain greater intensity of effect.

A host of highly practical parlor tricks can be performed with ultrasonics. Take for example, the siren perfected by Dr. Irving Rudnick of the University of Southern California. When Dr. Rudnick aims the super-speed sound waves of his siren on water, it boils in a matter of minutes. Paper held in front of the siren bursts into flame in a matter of seconds; cotton smolders in ten seconds; and steel wool burns within a minute.

Dr. Rudnick has also shown that dirty clothes placed in soapy water in an ordinary pan can be whitened in a few minutes simply by beaming his siren on them. Unfortunately, this ultrasonic washboard is not yet practical. Although it cleans clothes by literally shaking the dirt out of them, it does not always whiten them as well as soap does. Besides, various clothes react differently under the bombardment of high speed sound waves. A certain speed of sound wave will clean cotton in about 90 seconds, but it will tear silk to shreds!

Other Uses of Sound

Sound vibrations will also kill mosquitoes and other insect pests, as well as rats and even germs. In experiments at the University of California, scientists — using lethal doses of super-sound vibrations— have killed the germs that cause food poisoning. Applying this knowledge, milk companies can now pasteurize milk in a few seconds by passing ultrasonic vibrations through the liquid. The bacteria in the milk are literally beaten to death by the vibrations. Sound waves are just as killing as

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the heat of pasteurization, which requires from 30 to 40 minutes.

Milk can also be homogenized by sound waves. Ordinarily, milk and cream do not mix—at least, they won't stay mixed. But, treated with high-powered sound waves, the fat globules in the cream are completely broken up and the result is uniform consistency, homogenized milk. Sound has also been used for mixing more evenly and smoothly such things as peanut butter, face cream, paint and certain chemicals. Tomorrow's ultra-efficient kitchen mixer may be a sort of steel whistle device that will whip up fluffy-cloud waffle batter in less time than it takes to plug in the iron.

Just as the roar of a cannon blast can rock buildings, so super-sound can jolt fog particles out of the air thus clearing the way for planes and ships. This was actually done recently at the Navy's landing and experimental station at Arcata, Calif., where a battery of 12 sirens was set up for the experiment. The sound waves so vibrated the tiny fog particles that they merged and fell to the ground as heavy rain drops.

Now the United States Bureau of Mines is trying to apply the same technique against smoke. Already, they have discovered that sound waves can make tiny particles of carbon—which constitute the commonest forms of furnace smoke --group together into flakes that are so heavy they fall to the ground. But as promising as these experiments are, it is not likely that our skies will be freed from smoke screens right away. The process is expensive, and smokeless towns will not become a reality until science devises a more economical way of sweeping the sky with sound. Ultimately, such a technique will no doubt be developed.

Similar devices are already operating on a smaller scale in at least two industrial plants. In one —a paper mill—soda ash and in the other—a carbon black plant—carbon was being lost up the chimneys, representing thousands of dollars in waste. Because the materials involved are unusually fine particles, conventional air-filtration units were useless. Ultrasonics, however, can control them, because the waste gases when hit by a beam of super-sound are agitated so violently that the sub-microscopic particles cling together, forming lumps that are large enough to be collected and salvaged.

Experimental Units

One of the newest developments in applied ultrasonics occurred just last month when a Cleveland concern hit the market with a line of experimental laboratory units that will enable individual companies to explore the possibility of using ultrasonics in their own work. After months of experimental work, Brush Development Company has devised a new medium, barium-titanate, for converting electrical energy into ultrasonic sound energy. Brush has molded this compound into a series of ceramic shapes which it is offering to industry at about $1,400 for lab work.

The way Brush sees it, a company will buy the experimental units and go to work in its own lab on a host of possible applications. Afterwards, any that prove

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promising will be reviewed by Brush in its Cleveland pilot plant and—if a logical new application of ultrasonics results—Brush would be prepared to build a commercial unit that would utilize ultrasonics in actual production work.

Brush has made a substantial investment in its new lab tools but it believes it has been a wise one. For one thing, many industrial researchers have been anxious to explore the field of ultrasonics in their work and Brush, having provided the tools, sees a big market ahead.

At Beltsville, Md., Department of Agriculture experimenters have concluded that ultrasonics will stimulate the development of seeds and tubers, shorten germination of certain seeds, and produce mutations of known plants affecting coloring, size and appearance. They have also reported successful tests in destroying bacteria and disease germs.

Medical Uses

Super-sounds have gone to work on still another front—medical science. A gallstone detector utilizing ultrasonic waves has been developed by Penn State and is now being used in one hospital. At Princeton University, surgery without scalpels has become a fact. A diseased appendix was healed there by application of an ultrasonic "gun." Meanwhile, the Damon Runyon Cancer Memorial Fund has been sponsoring researches on the use of ultrasonics in attacking cancer, which now are said to be "promising."

The discovery that sound vibration can actually destroy harmful bacteria has given medical science a fascinating new field of exploration. One researcher, Dr. Leslie A. Chambers of the University of Pennsylvania, has succeeded in squeezing antigens out of cultures of disease germs by means of sound waves. Antigens are poisons secreted within the germs. Injected into human tissues in small quantities, they start the growth of opposing antibodies which kill the germs should they attack later on. The apparatus used in extracting antigens consists of a magnetized tube, usually made of nickel, which is made to vibrate rapidly by an alternating electrical current flow-

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ing through coils surrounding it.

Conventional methods of obtaining antigens employed heat or the introduction of chemicals. Neither method was entirely satisfactory, for many antigens died in the process. Dr. Chambers' method eliminates both heat and chemicals. A magnetized metal tube is inserted into a test tube containing a disease culture. Set to vibrating, the metal tube sends sound waves pulsating through the culture, shaking out the antigens unharmed.

New Cleaning Method

One of the latest industrial applications—though not yet ready for production work—is the de-greasing of metal parts by applying ultrasonic waves to a caustic cleaning solution covering the greasy parts. Thus the parts can be cleaned without accompanying fumes and at room temperature in just 10 seconds, rather than the 20 minutes by conventional de-greasing equipment.

Sound engineers believe that ultrasonics will soon produce new metallic alloys by virtue of its ability to combine metals of different melting points, such as iron and copper. In a molten mixture of iron and copper, the copper tends to separate out during the cooling phase. If the cooling mixture is subjected to a bombardment of ultrasonic waves, however, the molecules of the copper arrange themselves evenly throughout the entire metallic mass. The result is an iron-copper alloy, obtainable at present by no other method.

Castings can be de-gassed by applying sound while the molten liquid is cooling. Sound treatment can also increase the wetting power of a liquid, a fact which may prove of value to the textile industry. Concentrating sound near the surface of a liquid produces a fine spray or mist. This might be of use in the printing industry as a means of putting a fine, uniform layer of ink on rolls and printing plates.

Workers in ultrasonics must take almost as many precautions as those who deal with atomic energy. Since sound waves can shatter ear drums, laboratory workers wear cotton ear plugs covered by rubber sponges. The waves can burn a person's hands, if they are held too close to the center of intensity with the fingers closed. Consequently, researchers wear asbestos gloves for close work. Curiously, nearly everyone working with ultrasonics eventually becomes sick and heavily fatigued, for reasons no one has as yet been able to explain!

Technical Challenge

The young science of ultrasonics is now at the exciting stage where sound technicians are bursting with new ideas and are eagerly exploring every possibility that presents itself. They have as yet penetrated only the frontier of a new land, and the unknown territory beyond is an alluring challenge to them.

Operation Cost-Cutting

(Continued from page 14)

hourly rates, can often be reduced by wage incentive plans. Management consultants point out that a sound wage incentive system can increase productivity, and therefore lower unit costs an average of 25 per cent in most manufacturing plants.

Another highly effective means of conteracting inflated wage costs is the adoption of labor-saving machinery and equipment in both plant and office. Pullman-Standard Car Manufacturing Company, for example, has developed a railroad power ballast cleaner which can be run by one man. This device replaces the customary 28-man gangs using pneumatic hand tools. The estimated saving that can be accomplished with the $50,000 machine is $1,000 a mile.

Hand Operations Dropped

The replacement of manual materials handling by gravity chutes, power conveyors and fork lift trucks has also meant tremendous savings for some concerns. One publishing house has saved $74,000 a year by spending an initial $40,000 to install a palletization program for materials handling.

Hand lubrication of machines, long since replaced by mechanized lubrication in the steel and auto industries, is gradually being eliminated in other industries — rubber, textiles, printing, food processing and coal mining, to mention only a few. The cost of centralized lubri-

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cation, estimated at $4 to $5 a bearing or from three to five per cen of the price of the machine o which it is installed, customaril pays for itself quickly and the leads to long term savings.

Mechanized lubrication cut grease and oil waste as well as labo costs and almost guarantees an en to burned out bearings. At on General Electric Company plant two batteries of 20 punch presse are lubricated automatically ever 15 minutes from two central pumps Automatic lubrication while thes presses are running means an 1 minute gain in output for ever press every shift, plus other saving of production time that used to b consumed by machinery repairs when the presses were oiled b hand.

Automatic Equipment

By installing automatic equipment on 60 major production line and hundreds of smaller ones, on auto manufacturer was able t transfer 1,000 workers to more productive jobs. The new equipmen included iron hands to insert stoc into machines, plus robot-like devices that count, stack and load finished parts.

Auto makers, who are among th nation's most diligent economizers have made it a point to search fo savings in non-productive as wel as productive phases of their operations. Out of these research effort have come improvements in packaging, purchasing, parts distribution, materials handling and plan maintenance.

The Automobile Manufacturer Association recently reported som typical cases of skillful cost-cutting One manufacturer established a department to test various types o drills, dies and other tools, thereby finding methods to increase too life as much as 826 per cent o some jobs. On one type of too alone, $191,000 was saved within a year. Another company switched from rubber work gloves that cos $1.14 a pair and lasted one day t plastic gloves that cost 88 cents a pair and held up for three days Annual savings realized: $71,703.

By switching from permanen containers for shipping small parts to a container with a wood bas and cardboard sides, another aut company saves more than $1,000,00 year. The new box is sold for scrap after one use.

Obviously, there are almost uncountable ways by which companies can pare operating costs. Often, however, it is necessary to make a sizeable initial investment before savings are realized. The Denver and Rio Grande Western Railroad spent $300,000 for motorized equipment such as bulldozers, cranes and trucks for work along the tracks. Because this equipment took repair work off the tracks, and did away with work trains which block traffic, the carrier saves $750,000 a year.

Sometimes savings can be effected simply and with little or no extra outlay of money. One furniture manufacturer with national distribution found that his company was shipping more than 74 per cent of its products in less than carload lots. By using carload lot shipments where possible, the company was able to save $133,000 a year, or more than five per cent of its gross income.

Similarly, a food packing company has saved $40,000 annually in freight costs since it located a packing plant 100 miles nearer to the consumer market than had originally been planned.

Redesign Savings

Many manufacturers have saved tremendous amounts by redesigning products. The design stage is a particularly good place to think about economy because at this point no money has yet been invested in tools, equipment or material; no production orders issued and no operators trained. A typical case is that of American Greeting Publishers, Inc., which made a design change in one of its novelty products enabling it to replace a hand-stripping and hand-gathering operation with an inexpensive machine folding operation.

A foundry pared its fuel costs 25 per cent by switching from oil to gas. Additional benefits were realized because gas heat turned out a higher quality, less porous casting, than the previous fuel, thus reducing the number of rejects.

Reduction of fixed operating costs presents much more of a problem for management than those of a variable nature. Often it requires a long range program involving

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large capital expenditures. Many foresighted companies, however, are spending money today to replace high-cost facilities in order to insure profits when the present demand for their product declines.

In one case, a company found that after moving its plant to another location and making a new capital investment in buildings and equipment, its break-even point was lowered from 55 per cent of present capacity to 42 per cent and that profits, under a projected sales demand, would be improved 400 per cent. Fixed costs were reduced substantially. And, finally, the money received from the sale of the old facilities came close to being enough to pay for the new plant!

A similar case is that of the Chicago Title and Trust Company. By moving to a new building, the company has been able to concentrate most of its title work on one floor, whereas it formerly occupied several floors. This centralized layout, plus the installation of the most modern office equipment and intra-office communications, enables the company to turn out the same amount of title work in four days that formerly required six. The job is also accomplished with 100 fewer employes.

All these examples of cost savings have dealt with tangible aspects o business. Actually, a cost reduction program often must start with action in the field of intangibles.

It is the belief of many businessmen (as indicated by repeated testimonials at the National Management Engineering Clinic) that teamwork between members of management and between management and labor is indispensable to a successful cost reduction program.

"Where animosity exists," President Coleman of Burroughs Adding Machine said, "no machine, no method, no scientific discovery would possibly achieve the savings in costs that would result from real and effective cooperation."

Several speakers recommended that management explain its cost problems to employes and explain how their own best interests can be served by solving them. Clearly, every one in an organization must participate actively to make a cost reduction program really work.

Perhaps the most succinct statement any businessman has made on the subject of cost reduction came from a convention speaker some months ago. Calling cost reduction a positive approach to business survival, he said it is the "key to continued prosperity under a rising standard of living."

Here, There and Everywhere

(Continued from page 8)

passed 3,406 more laws than in the previous year. Congress, however, was probably the most selective of all legislative bodies, for of some 10,534 bills that landed in the Congressional hopper only 440 bills emerged from both houses.

• **Favorable Ground Here** — Soil in the Chicago area, reports the Illinois Institute of Technology, is ideally moist and thus adaptable to the use of heat pumps for taking warmth from the ground to heat, as well as cool, the house of tomorrow. In Chicago an area equal to 75 x 75 feet is sufficient for a heat withdrawing coil capable of supplying the needs of a six-room home, according to IIT.

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Invest in the MIDDLE WEST

Reviews of Middle-western Companies

By DANIEL F. NICHOLSON

IN LESS than 20 years, Abbott Laboratories, by a series of spectacular sales gains, has grown from a small company to a top place in the highly competitive drug and pharmaceutical field. From $3,622,646 in 1932, the company's sales spurted to $9,509,911 in 1937, to $20,005,138 in 1942, and to $66,930,713 in 1948. The gain has continued this year, with a rise of 5.2 per cent for the first nine months. September sales were the largest for any month in the company's history.

Accompanying the rapid growth in sales there has been an equally impressive increase in earnings, a vast expansion in production capacity, and the creation of an exceptionally strong financial position.

Research And Sales Programs

Two factors have been of primary importance in the Abbott record: One is the company's research activity, the other is its selling program. Each year Abbott introduces dozens of "new" products. Last year, for example, the company reported 56 new items, and the year before 61. Many of these new drugs and pharmaceutical or chemical preparations represent improvements or modifications of drugs already in use. Over the years, Abbott has also won an excellent reputation with the medical profession for the development, in its own research laboratories, of important completely new drugs and other products. These include Nembutal, a short-acting barbiturate; Pentothal Sodium, an intravenous anesthetic in wide use; Aminosol, a protein hydrolysate from blood fibrin for intravenous use; Diasone, a drug for the treatment of leprosy and certain forms of tuberculosis; Dulcet Tablets, a candy medication dosage form for children; Metaphen, an antiseptic; Thenylene Hydrochloride, an antihistaminic; Tridione, a drug for the control of petit mal epilepsies; and a plastic device called the Aerohalor, used for the inhalation of penicillin dust.

Abbott manufactures and does extensive research on drugs developed by others. In recent years the company has devoted much attention to research in antibiotics, such as penicillin and streptomycin. Two new buildings for the fermentation and extraction of antibiotics were completed recently. The company also is doing research in radioactive isotopes and their application to experimental and clinical medicine. The use of isotopic materials is under the control of the Atomic Energy Commission and is limited to qualified research organizations. The radioactive pharmaceuticals produced by Abbott are distributed to research and medical institutions on a non-profit basis.

The rapid strides in medicine are indicated by the fact that 90 per cent of Abbott Laboratories' sales, in dollar volume, is represented by products that did not exist 20 years ago. More than 70 per cent of sales represent products less than ten years old. The number of products manufactured by the company averages about 1,000, against 5,000 for some of its principal competitors.

Advertises To Doctors

While Abbott manufactures a number of items that can be sold by a druggist without a prescription the company does not advertise to the consuming public but confines its promotion efforts entirely to the medical, dental, pharmaceutical, and veterinary professions, and to hospitals.

Abbott's excellence in research and manufacturing ability has been indispensable to its growth, but it is doubtful that this alone would have enabled the company to make more than a fraction of the progress

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actually achieved during the last two decades. Other companies, competitors, have also had outstanding reputations for research and quality of products, but have not matched Abbott's sales growth. The difference, apparently, is in the sales job done by Abbott. It is significant that the current president of the company carries the additional titles of general manager and director of sales.

Abbott does business in every country in the world except Russia. In the United States the company maintains sales branches, each with a complete line of products, in eighteen principal cities. In addition to the direct contacts made by salesmen with the medical profession, Abbott advertises extensively in medical magazines and publishes a monthly magazine, "What's New," containing medical articles. The magazine compares favorably with the finest commercial consumer magazines in format and appearance, with excellent art work, high quality paper, and multiple colors. Equally attractive pamphlets and mailing pieces are sent to physicians and pharmacists to advise them of new products, new dosages, or other new developments.

Most Abbott salesmen are pharmacy school graduates. In addition to this background, the salesmen are given complete training with respect to the company's own products and its manufacturing operations.

History

Today's Abbott Laboratories, with its modern plants and highly refined scientific methods, offers a marked contrast to the company's origin in 1888 when Dr. Wallace C. Abbott started the business as a one-man enterprise in the kitchen of his suburban Chicago home. When Dr. Abbott began the practice of medicine, bulky and unstandardized fluid extracts and tinctures were in general use by physicians. Dr. Abbott became interested in active-principle medication whereby pure alkaloids or active principles are isolated from crude drugs and administered in the form of pills or granules. Dr. Abbott produced these pills and granules and sold them to other physicians.

In 1900, the business was incorporated as the Abbott Alkaloidal Company, and the present title was adopted in 1914. In 1922, the company acquired the Dermatological Research Laboratories of Philadelphia, and in 1928 John T. Milliken and Company of St. Louis, was acquired. The most recent plant expansion by acquisition occurred in 1930 when Swan-Myers Company of Indianapolis was merged with Abbott.

Plant Facilities

In 1925, operations were moved from the original district to the present plant site in North Chicago, Ill., where the company now operates 34 buildings on a 26-acre tract. Floor area of the buildings is 785,630 square feet. Wholly-owned subsidiary companies operate plants in Canada, Mexico, England, South Africa, Australia, Brazil, Argentina, Peru, Chile and Uruguay.

The company's annual report for 1948 declared that the postwar plant expansion program was largely completed in 1948. However, a new $2,000,000 plant is now being planned for next year at North Chicago.

Abbott has approximately 5,600 employes, and reports satisfactory labor relations. The company main-

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tains a retirement plan for employes, as well as group life, health and accident insurance. These programs were expanded in 1948.

An unusual feature of the Abbott management is that the board of directors is composed entirely of active senior officers of the company, with no so-called "outside" directors.

Earnings Record

Earnings have increased substantially but at a somewhat slower rate than sales. This has reflected not only increased costs for wages and materials in recent years, but also a steady downward trend in prices of the company's principal products. This decline in the period from 1940 to 1948 amounted to 22.7 per cent.

In 1948 net earnings amounted to $11,120,983, equal to $5.95 a share on stock outstanding at the end of the year, against $10,216,165, or $5.46 per share, earned in 1947. In the nine months to September 30, 1949, net earnings were $8,994,689, equal to $2.41 a share on the increased number of shares now outstanding, against $8,646,200, or $2.31 a share, earned in the first nine months of 1948.

A ten-year comparison of net sales and net earnings follows:

Year Ended Dec. 31	Net Sales	Net Earnings	*Per Share
1948	$66,930,713	$11,120,983	$5.95
1947	59,621,175	10,216,165	5.46
1946	54,209,838	10,820,627	5.79
1945	37,929,521	3,156,795	3.57
1944	38,428,088	3,039,513	3.43
1943	33,264,630	3,285,508	4.04
1942	20,005,138	2,208,653	2.76
1941	16,744,080	2,245,811	2.90
1940	12,981,286	2,239,408	2.89
1939	11,485,415	2,048,094	2.61

*Based on stock outstanding at end of year.

The company reports that operating results have been in the profit column for at least the last 45 years.

Only Current Debt

Abbott has no funded or other debt except current liabilities, and the preferred stock issued late in 1941 was retired in 1946. Cash dividends have been paid quarterly without interruption since the company's stock was listed on the New York stock Exchange in 1929. In addition to cash dividends, stockholders received a stock dividend of 33⅓ per cent in 1935, a three-for-one split in 1936, a five per cent stock dividend in 1939, a two-for-one split in 1946, and a two-for-one split in April of this year. Cash dividends declared in 1948 amounted to $3.40 a share, and compared with $3.25 a share in 1947.

Dividends declared in 1949 include 65 cent regular and an extra of 35 cents a share declared in February on the old stock, a regular dividend of 40 cents and extras of five cents declared in May and August and 10 cents in November on the new stock.

The capital stock is listed on the Midwest Stock Exchange and the New York Stock Exchange.

At the end of 1948, Abbott's holdings of cash and marketable securities totaled more than $20,000,000, while total current liabilities were $16,253,000. Aggregate current assets amounted to $49,701,186, and total assets were reported at $66,149,523.

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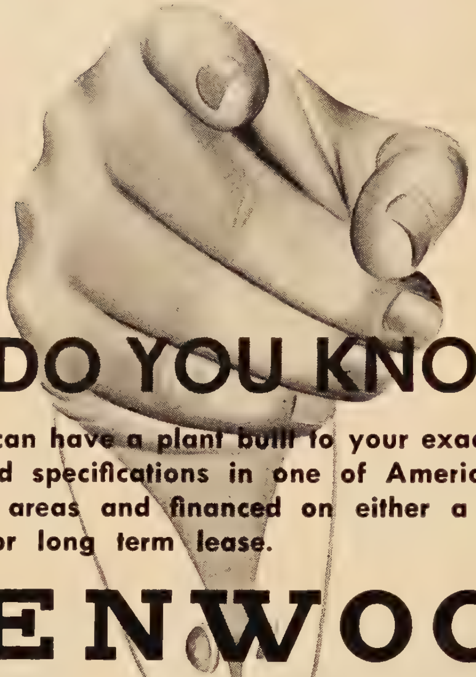

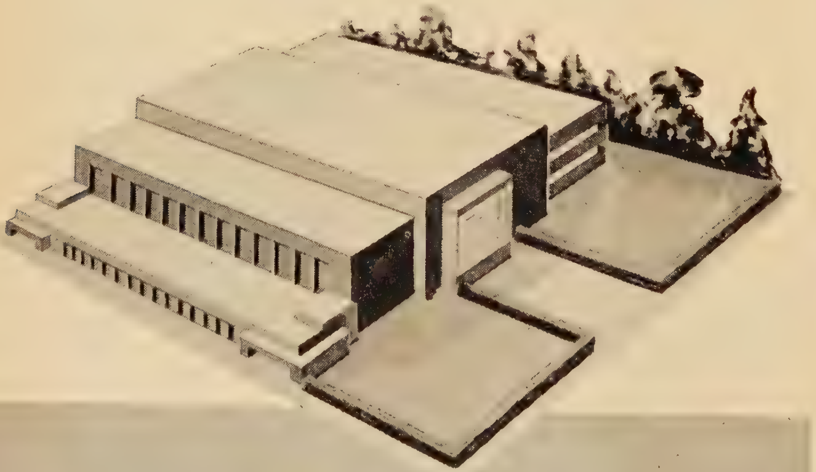

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PHIPPS INDUSTRIAL LAND TRUST—Owners

The Next 100 Years

(Continued from page 22)

of necessity raised to protect the margins of the higher-cost producers.

The complications are of course still greater when the wage increases in one industry become the more or less enforced pattern for general increases throughout all industry. The inevitable result is a general rise in prices which, in turn, leads to demands for compensating wage increases. Moreover, under the farm parity principle the rise in industrial prices must be matched by a corresponding increase in the prices of agricultural products. The ultimate result of this distortion is to weaken the income position of unorganized workers, of salaried professional classes, and of those living on fixed incomes. These groups, who comprise many millions of people, suffer a positive reduction in real income.

In contrast, the price reduction method generates a general expansion of demand. Starting with the same assumptions as above with respect to the increase in efficiency and the saving of labor power, the million dollars of savings would permit a reduction in the price of the commodity being produced. Thus inducement is offered to consumers to buy more of this company's product, the lowering of the price being a positive measure calculated to bring an immediate stimulus to demand—thereby tending to sustain employment.

Price Reduction Method

The price reduction method of passing along the benefits of technological progress serves to disseminate the gains to society as a whole. Through the play of market demand, it helps to maintain a flexible economy, responsive to the wants of the masses. It promotes a balanced society, and reduces class and group conflict. The social benefit can, of course, be fully realized only when the practice is followed in all sectors of the economy—in agriculture, transportation, and trade, as well as in manufacturing, mining, and public utilities.

Granted that the foregoing analysis is sound as a matter of logic,

(Continued on page 43)

INDUSTRIAL DEVELOPMENTS

IN THE CHICAGO AREA

INVESTMENT in industrial developments in the Chicago Industrial Area totalled $8,258,000 during November compared with $15,907,000 during November, 1948. Total expenditures for the first eleven months of 1949 were $96,014,000 compared with $146,862,000 for the same period in 1948. These developments included new construction, expansion of industrial buildings, and the purchase of land and buildings for industrial purposes.

Abbott Laboratories, North Chicago, producer of drugs and pharmaceuticals, is building a five-story and basement addition to one of its plants. The addition, which will contain 270,000 square feet of floor area, will provide both production and warehouse space.

Howard Foundry Company, 1700 N. Kostner avenue, has purchased the plant on the northwest corner of Bloomingdale and Lamon avenues.

Lenc and Smith Manufacturing Company, Milwaukee, Wis., will erect a one and two-story factory at 19th street and 46th avenue in Cicero. The plant will contain 80,000 square feet of floor space. The company makes cabinets and wood specialties. Klefstad Engineering Company, general contractor.

United States Steel Products Company, Dolton, Ill., manufacturer of steel containers, has added working and storage space to its plant. The company is a fabricating unit of United States Steel Corporation.

E. I. DuPont de Nemours and Company, Inc., Grasselli Chemical Division, East Chicago, Ind., is constructing a one-story, 40,000 square foot, addition to its plant.

St. Charles Manufacturing Company, St. Charles, Ill., will construct another building on a site near its present plant in St. Charles. The company manufactures steel kitchen cabinets and work surfaces.

Renard Linoleum and Rug Company, St. Louis, Mo., is constructing a large warehouse at 2825 W. 31st street. A. Epstein and Sons, Inc., engineer.

Admiral Corporation, radio and television manufacturer, has acquired an industrial building on the northeast corner of Springfield avenue and Cortland street.

United States Brewing Company is constructing a bottling unit on its property at 2519 Elston avenue. Paul E. Griffenhagen, engineer.

Douglas Furniture Company, formerly at 817 S. 55th avenue, Cicero, is moving to larger quarters at 5555 W. 65th street in the Clearing Industrial District.

Benjamin Electric Manufacturing Company, Des Plaines, Ill., is constructing an additional building at its plant. The company makes industrial lighting and signaling equipment as well as a line of enameled products.

Trowbridge Corporation, subsidiary of Victor Surgical Gut Manufacturing Company, 1305 W. 45th street, is constructing a factory building at 5115 S. Millard avenue. The building will be a one-story structure which will contain approximately 28,000 square feet of floor area.

Markstone Manufacturing Company, 1917 N. Springfield avenue, has purchased the plant at the corner of George street, Campbell and Elston avenues from the Cinch Manufacturing Corporation. The company manufactures fluorescent lighting equipment.

Mapes Consolidated Manufactur-

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ing Company, Griffith, Ind., manufacturer of paper plates, egg crates and food packages, is constructing a large addition to its plant.

Klein Filter and Manufacturing Company, manufacturer of filtration equipment of stainless steel and brass for the brewery, distillery and chemical industries, is building an addition to its plant at 1225 W. School street.

Labels and Decals, Inc., 20 W. Lake street, Oak Park, is constructing a plant at 4800 W. Grand avenue.

David Architectural Iron Works, 3021 W. Walnut street, is constructing a 6,000 square foot addition to its plant.

Illinois Interior Finishing Company, 7521 S. Greenwood avenue, is erecting an 8,000 square foot plant addition.

Doehler-Jarvis Corporation, 2259 W. 43rd street, manufacturer of aluminum and zinc alloy die castings, is building an addition to its plant.

Trends In Finance and Business

(Continued from page 10)

may be sued directly in the courts of the state into which he moves. They also offer assistance in reaching the taxpayer's property located in another state.

The eight states which now allow the out-of-state collector direct use of their courts are Alabama, Maine, Mississippi, Missouri, Oklahoma, Oregon, Tennessee and Wisconsin. Two other states have had such legislation since 1939.

Correction: A typesetter's finger became glued somehow to the zero key last month and a figure in this department that should have read $120,000,000 came out $120,000,000,-000. The item should properly have read: "More than $120,000,000 is presently owed to Illinois banks on installment loans, according to a study by the Illinois Bankers Association." The editors apologize.

What Do Workers Really Think of Management

(Continued from page 17)

tion. As a result his complaints accumulate and create a generalized anti-job, anti-management attitude that frequently leads to insubordination, limitation of output, abuse of equipment, excessive absenteeism, and stalling.

Some people are chronic malcontents, but the vast majority of workers are not; their frustrations have arisen on the job and as a result of specific situations. Many have come to believe, consciously or unconsciously, that their union, and their union alone, will see that their job and factory situations are improved. It is the worker's union that will insist that management not treat him as a commodity, that management will be more liberal as far as pay, insurance of security and seniority are concerned, and that the management will listen to complaints and do something about them.

Careful questioning of management personnel has disclosed a number of equally arresting attitudes. We have polled almost 20,000 supervisory personnel, and have weighed their public and private statements against their policies and actions. While our conclusions obviously do not fit every executive interviewed, they do reflect the attitudes of 70 per cent of them.

On the basis of these findings, it appears that most members of management have accepted what might be called a military concept of their relations with subordinates. They conceive of themselves as the "givers" of orders; participation in management by subordinates is neither expected nor encouraged.

These are blunt words, yet the facts are that practically no members of top management in organizations of more than 25 persons actually have effective two-way communication with the lower echelons in their companies. There is at least one good reason for this. As a rule, top management is mainly concerned with such matters as sales, production, and financing; and in these areas it is plainly unrealistic to endeavor to assemble the opinions of large numbers of workers before reaching a decision.

Even in areas involving far less important matters than top management decisions, however, communication channels are badly clogged. Many company presidents honestly believe there is an "open door" to top management's office and that workers are free to come in and "discuss" problems and grievances.

Of the 127 plants which we studied this has actually been found to be true on only one case. In many others, the "open door" policy ostensibly prevailed, but few workers ever took advantage of it. When they did, it was in the manner of a small boy running through a bonfire to prove his courage.

Some managements have contended that workers do not utilize the "open door," simply because the company's working conditions are already better than average, supervision is competent, and wages are fair and equitable. Actually, it was found that grievances were just as common in plants where the "open door" existed, but was not utilized as in plants where the policy admittedly did not exist.

There is another unfortunate phase of management's attitude toward workers. To many top executives, people appear (often unconsciously) as adjuncts of machines, as persons to whom jobs are given. Their duties are to keep production moving—always. In the total configuration of the factory, people become elements, much like raw materials, finances, machines, packages, and bills of lading.

Key Problem

The key problem of private enterprise would seem to be — if our findings are correct — how to reconcile the necessities of large-scale, low-cost production, with the retention of high worker morale. Some managements have understood that, but also assumed that they knew without careful study what employe morale needed. Hence we have seen employe libraries, swimming pools and gymnasiums. But, in many cases, as soon as the novelty of these "gifts" wears off, the same employe sentiment towards management prevails.

What appears to be a sound procedure is first, a systematic determination of the factors which lead employes to distrust and resent management in a particular plant, and, second, corrective action where relief is needed.

The determination of the factors which cause employe dissatis-

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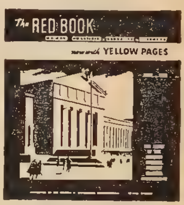

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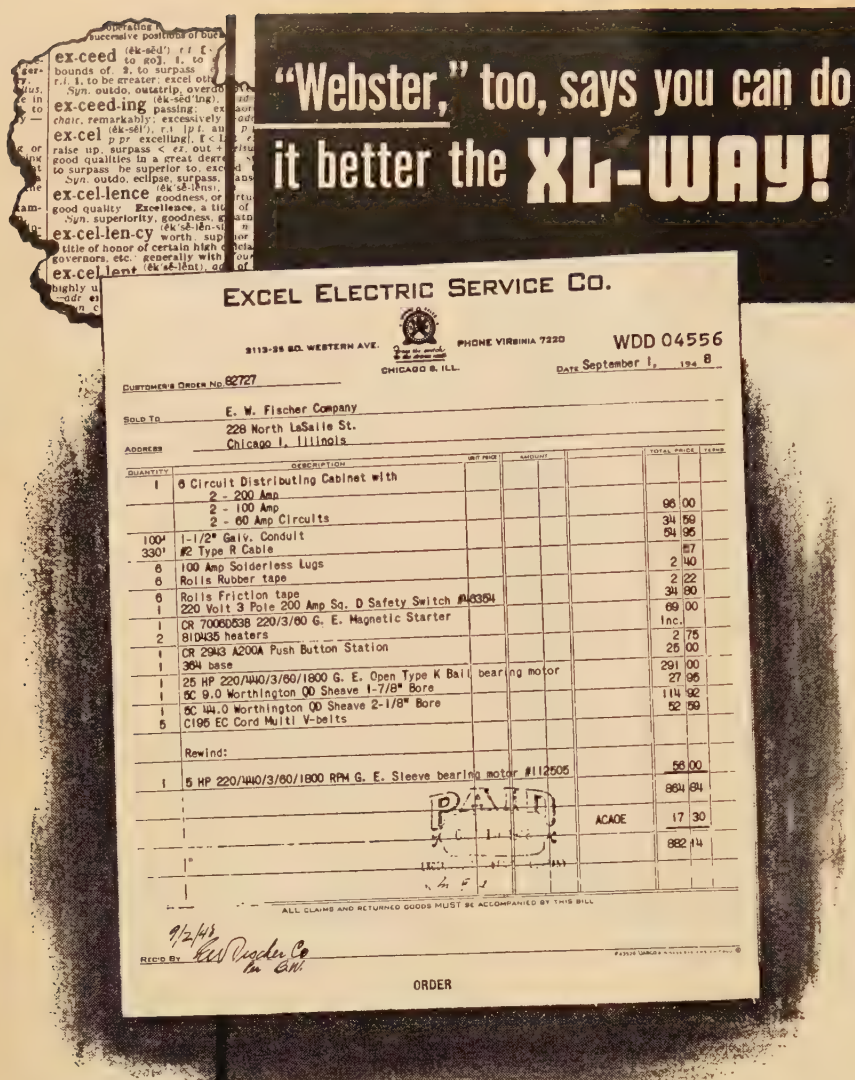
faction requires an objective study of employe opinion and attitudes on working conditions, training techniques, quality of supervision, opportunities for advancement, rates of pay, wage and salary inequalities, and relations with top management. These may be ascertained by periodic opinion polls of the whole working force, follow-up interviews with new employes, and exit interviews.

Equally helpful, if carefully administered, are orientation programs for new employes, individual counseling with employes, employe manuals and instructions, house organs and bulletins, supervisory training courses, communications to employes' homes, "open house" for workers' families and friends, management conferences with employes and junior boards of directors.

Helpful Service

Finally, rendering a real personal service to employes when they need help is the most dynamic way of demonstrating that management is a friend of the worker, that its power and community status is available to help him. This might include income tax service, a visiting nurse, candy on employe birthdays, a letter from the president on anniversaries of the employe's stay with the company. It might include some medical dispensary care, perhaps a co-operatively operated recreation center. Minor legal trouble is a problem most workers face at one time or another. They may lose their car, their furniture, their radio, their home. Help in such legal mazes through the personnel department or a service bureau in the plant is a potent morale builder.

This is the sort of friendship that is no mystery to a ward committeeman. In the Spring of 1948, when rains flooded the basements of many workers' homes in Ottumwa, Iowa, John Morrell and Company promptly had the basements of its employes' homes pumped out. In a subsequent poll held in the community, Morrell and Company showed up a glowing business leader in the area — not because of its generous insurance plan or its pension system or high wage rates. Morrell was a community favorite because it took enough personal interest in its workers to pump out their flooded basements!


ex-ceed (ĕk-sēd') v.t. to go]. 1. to
bounds of. 2. to surpass
v.i. 1. to be greater; excel oth
Syn. outdo, outstrip, overdo
ex-ceed-ing (ĕk-sēd'ing). passing; ex
chaic. remarkably; excessively
ex-cel (ĕk-sĕl'), v.t. [p.t. p.pr. excelling]. [< L
raise up, surpass < ex, out +
good qualities in a great degre
to surpass be superior to, exceed
Syn. outdo, eclipse, surpass,
ex-cel-lence (ĕk'sĕ-lĕns), goodness, or virtu
good quality Excellence, a tit
Syn. superiority, goodness,
ex-cel-len-cy (ĕk'sĕ-lĕn-si) worth, superior
title of honor of certain high officia
governors, etc.: generally with
ex-cel-lent (ĕk'sĕ-lĕnt)

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1	5C 44.0 Worthington QD Sheave 2-1/8" Bore				52 59	
5	C195 EC Cord Multi V-belts					
	Rewind:					
					56 00	
1	5 HP 220/440/3/60/1800 RPM G. E. Sleeve bearing motor #112505				864 84	
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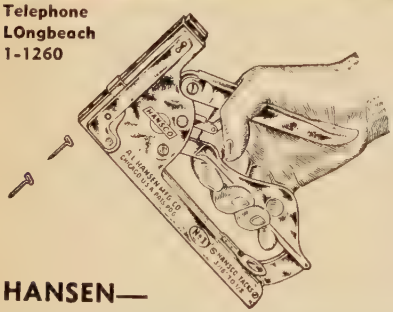
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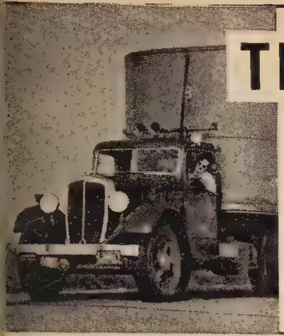

TRANSPORTATION and TRAFFIC

☆

THE Interstate Commerce Commission in their report in I. & S. M-2745, Stopping-In-Transit Central Territory, finds there is a commercial necessity for motor carriers providing two stops en route between primary point of origin and point of final destination to either complete loading or partially unload truck load shipments. They also find that there is a necessity for motor carriers providing an additional pick-up at point of origin and an additional delivery at point of final destination. An order requiring the establishment of such rules will be entered. Proposed rules of the carriers, published in tariffs to become effective May 18, 1947, and later dates, restricting stopping-in-transit to one stop en route, to single line traffic only, and to routes not in excess of 112.5 per cent of the carriers' shortest certificated route between point of origin and final destination, were found by the commission to be unreasonable. These proposed rules were suspended by the commission on the protest of the Chicago Association of Commerce and Industry, and others, and the matter assigned for investigation. At the hearings the Association presented evidence to show that the shippers find it necessary, in many cases, to ship a truckload of freight to two or three different consignees in order to supply the needs of their customers, and also pointed out how restricting stopping-in-transit service to single line traffic would discriminate against the shipper who is required to use joint service. The commission's report states that so-called stopping-in-transit and split pick-up and delivery by motor common carriers are extra transportation services and not special privileges usually included in the designation of "transit."

Modified Rule 10 Approved for Publication: The Western Traffic Executive Committee has approved the modified Rule 10 (mixed carloads) for application from, to and within Western Trunk Lines and Southwestern Freight Bureau territories. The "streamlined" rule will become effective December 1. The new rule provides that a mixed carload shipment will be charged for on the basis of actual weights and respective carload rates applicable on each commodity in the shipment. The carload minimum weight will be the highest provided for any article in the mixed shipment and any deficit in the minimum weight will be charged for at the highest carload rate applicable to any article in the mixed carload. Under the previous rule the charges and minimum weight on a mixed carload shipment were the highest applicable to any article in the carload. Establishment of the modified Rule 10 in western territory has long been advocated by the Chicago Association of Commerce and Industry.

Motor Rate Increase From Chicago Suspended: Proposed increased motor carrier rates on shipments under 5,000 pounds applicable between Chicago and other points in central and northern Illinois on the one hand, and points in Central territory on the other, were suspended by the Interstate Commerce Commission. The suspended rates, published in Central States Motor Freight Bureau Tariff No. 220-B to become effective October 29, would have increased the rates on shipments under 5,000 pounds to a basis 10 per cent plus 20 cents per cwt. above the rates applicable on shipments over 5,000 pounds. The commission has assigned the matter as I. & S. Docket No. M-3155, Increases-Motor-Cen-

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tral, Illinois Territories, and hearing will be held December 5 at the Palmer House, Chicago, before I. C. C. Examiner Tobias Naftalin. In a petition for suspension of the proposed rates, the Chicago Association of Commerce and Industry charged that publishing increased rates from Chicago without publishing similar increases between other points in Central territory would result in undue prejudice to shippers and receivers of freight in the Chicago area and undue preference to shippers located in other points in Central territory.

Also assigned for hearing December 5 are suspended increases in the minimum charge in Central and Chicago Suburban territories and in the accessorial charges in Illinois, Indiana and Wisconsin.

Eastern Railroads Granted Fare Increase: Eastern railroads have been authorized by the Interstate Commerce Commission to increase passenger fares by 12.5 per cent. The increase will bring the coach fares to approximately 3.375 cents a mile and the parlor and sleeping car fares to 4.5 cents per mile. Based on 1949 operations, the fare boost is estimated to yield the railroads an additional $37,800,000 annually.

Mighty Argonne

(Continued from page 20)

are separating out microscopic parts of cells and using the electron microscope to look for changes in them caused by radiation.

One puzzling question is the considerable time which elapses between radiation and the appearance of cancer. Tissues and cells are being examined for chemical and structural changes that occur during this period, but which are invisible by ordinary means of examination. For example, the changes in the lens of the eye resulting from neutron exposure might be missed in tissues such as muscle, which are not transparent.

Despite its worldwide importance, Argonne is only one part of the entire Atomic Energy Commission's program. This year the commission plans to spend $210,000,000 for the continued development and production of bombs; $300,000,000 more for the production of fissionable materials. Its total current budget authorization is $700,000,000.

Significantly, however, 90 per cent of AEC expenditures have been directly or indirectly related to developing and producing fissionable materials and weapons. This nine to one ratio is not expected to shift downward while our "cold war" with Russia continues.

The AEC's preoccupation with the military, rather than the peacetime, implications of atom splitting is not hard to explain. Seven years after the dawn of the so-called "atomic age," the United States continues to be the leader in atomic

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know-how. It is, however, a challenged leader for the simple reason that there are no permanent secrets regarding atomic knowledge. Actually, the Coca-Cola formula is probably more of a secret than are the fundamental facts regarding the making of an atom bomb.

Some people are therefore questioning the tight security screen which has been drawn about the operations of the Atomic Energy Commission and such installations as Argonne National Laboratory. Among these critics are such men as Dr. Harold Urey of the University of Chicago, an outstanding atomic scientist, who believes that atomic research in this country has bogged down since the war, largely because of constricting security regulations which, he declares, has caused many leading physicists to leave the research program and return to their prewar work. Another critic, Dr. Frederick Seitz of the Carnegie Institute of Technology, has suggested that the nation's big "secret" is reminiscent of the French attitude toward the highly-touted Maginot Line, which ultimately proved worthless.

Secrecy Justified

Argonne officials are not authorized to reply to such charges publicly, but their position is that virtually any new research development may bear importantly upon the nation's future security. Hence, they say, it is only common sense to retain the utmost secrecy regarding activities which may involve offensive or defensive warfare, however indirectly. Furthermore, they say, the nation's atomic energy program has adequate scientific man-power; what it most needs today is the completion of projected new plants and technical facilities.

However sound the secrecy arguments may ultimately prove, one fact is indisputable: the scope of Argonne's research program is steadily expanding. It might be assumed that the expansion is due to foreign atom-bomb developments. The more logical explanation is, however, that a number of building and development plans, drawn up months ago, have now been completed enabling the overall research program to progress faster today than at any time since the war ended.

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New Products

Anti-Glare Glass

A new safety plate glass for automobile windshields and sidelights which reduces glare and heat has been developed by the Libbey-Owens-Ford Glass Company, Toledo 3, Ohio. The glass is chemically tinted a slight bluish-green enabling it to exclude more than 15 per cent of the infra-red rays of sunshine. As a result, according to L-O-F, eye fatigue is reduced materially and driving comfort is increased, particularly on hot sunny days.

Nylon Typewriter Ribbon

Nylon finds one more application in a new typewriter ribbon introduced by Remington Rand, Inc., New York 10. The all-nylon ribbon is said to give sharp, clear impressions because of the thinness and flexibility of the fabric. In addition, the nylon fabric is said to replenish its ink supply rapidly after a key strikes, affording increased uniformity of printwork.

Blueprint Cabinet

"Draw-In-Dex" is the name given by Empire Development Corporation, New York 4, N. Y., to the company's new blueprint file cabinet which accommodates 1,000 prints, each suspended from cross bars for wrinkle-proof storage. An index file enables each print to be spotted quickly and removed individually.

Safety Whistle

An all-rubber safety whistle for rubber crib toys has been developed by American Anode, Inc., a subsidiary of B. F. Goodrich Company, Akron 18, Ohio. The whistle uses no metal and, when incorporated in rubber dolls and toys, cannot fall out for youngsters to swallow.

Clogless Centrifugal Pump

After five years of developmental work, Fairbanks, Morse and Company, 600 S. Michigan Ave., Chicago 5, has introduced a radically new centrifugal pump which is virtually clog-proof. The secret of the new pump lies in the fact that it eliminates the conventional whirling blades. Instead, F-M's pump utilizes a revolving, cork-screw-like mechanism that takes in fluid at a center inlet, then whirls it about at high speed along the sides of an increasingly-larger, coiled tube until it reaches the outlet. As a result, even rags and heavy foreign material will not clog the pump, so long as they can be handled through the inlet. The bladeless pump will be available in sizes ranging from two to five inches.

Safety Aide

Chase Chemical Company, 2901 Dover Ave., Cleveland 9, has introduced a hand and arm cream, called "Glov-Cote," which is said to guard skin pores against dermatitis when applied by workmen using paints, lacquers, printing ink and oil.

Easy Addresser

A hand addressing device involving a printed stencil that is easily rolled over envelopes and post cards has been introduced by Heyer Corporation, 1850 S. Kostner Ave., Chicago 23. The printing stencil is a roll upon which some 250 addresses can be typed. Afterwards, it is loaded into the hand addresser and inked for up to a 100 or more impressions by a cartridge ink wick. Seven lines of copy can be typed for each address.

Quick-Operating Chuck

The Westcott Chuck Company, Oneida, N. Y., has developed a new, versatile three-jaw universal chuck which it believes will speed up machine shop work by a substantial margin. Lathe machinists, says Westcott, can lock their work in place 10 times faster with the new chuck, and final jaw gripping is hastened by simple wrench adjustments. The customary adapter plate is eliminated because the new chuck is threaded for direct attachment to 1½-inch-8 thread lathe spindles.

Robust Thermostat

Another engineering development is a new thermostat which, according to its manufacturer, Dole Valve Company, 1901 Carroll Ave., Chicago 12, holds its valve at the proper degree of opening against the most powerful water pump at any car speed, regardless of outside temperature. Called the DV-I, the new thermostat consists of a brass butterfly valve assembly, operated by a unique thermostatic piston unit which is said to develop a power heretofore unattainable in thermostatic valves.

Fluorescent Converter

The Arch Manufacturing Company, 1708 Howard Street, Omaha, Neb., has developed a fluorescent lighting adapter which is said to convert bulb-type lamps to fluorescent lighting in a few minutes. The unit fits most floor and table lamps and consists of two circular-type, 15-watt lamps and two button switches.

Tamper-Proof Lock

Sargent and Greenleaf, Inc., Rochester, N.Y., has introduced what is described as a burglar-proof lock. The idea is that it operates so delicately that burglars cannot detect the combination either by sound or touch when tumblers drop. The locks are equipped with a key dial or a knob dial, either of which works on the same principle.

Simplified Thermometer

A new, time-saving thermometer has been introduced by the F.W.C. Dillon Company, 5410 W. Harrison Street, Chicago 44. In place of the usual fitting required on conventional industrial thermometers, the new instrument has an attached magnet that holds it to flat metal surfaces for direct-readings. The maximum reading is 1000 F.

The Next 100 Years

(Continued from page 34)

it may still be contended that some place must be given to money-wage increases. Since the worker in any given establishment may consume little or none of its product, a price reduction appears of no value to him. What he desires is more dollars with which to buy more of whatever goods or services he may desire. In view of this readily understandable psychology, if wage rates were never increased, there would be a dulling of labor incentive, and some of the potential reductions in costs would not be realized. For these reasons both methods have a place. A com-

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promise has to be worked out by each individual business enterprise through discussions and negotiations with its own workers.

Sharing company profits offers another means of increasing labor income. A share in profits resembles wages in that it is received in the form of money income. Since it is contingent upon earnings, it cannot be counted on for sure and can only be paid periodically. It has an advantage over wage increases in that the supplementary payments do not become a part of the cost and price structure.

Profit-Sharing

Profit-sharing schemes of various kinds have long been employed by numerous companies, and on the whole with satisfactory results. The idea has been, however, strongly opposed by labor leaders and also by prominent industrialists. The opposition of labor leaders appears to be based, first, on the fact that the role and prestige of the labor leader is greatest when he can claim credit for obtaining increases in the weekly pay check, and, second, on the knowledge that profit-sharing plans tend to draw employers and employes closer together and to emphasize the mutuality of interests. Another objection is that a share in profits is uncertain at best and may be made an excuse for never granting wage increases. On the other hand, a wage-rate increase becomes a definite contractual obligation which can be counted on.

The opposition of employers is based on a simple principle. It is contended that exceptional profits are due to exceptional management; and since the contribution of labor is no greater in the exceptional plant than in the ordinary or marginal plant, labor is not entitled to a share. All companies should pay the market rate of wages, but should not be expected to give to labor a share in the gains that are directly attributable to management. In the writer's view this conception fails to take account of one significant phase of the problem. Experience suggests that the incentives which profit sharing provides for the workers may make possible the procurement of superior workmen, a reduction in rate of turnover, and an improvement in industrial relations generally.

We come now to the third source of concern with respect to our economic future, namely, the ever expanding scope of government control over private enterprise. Since World War I, and especially since 1930, both in the United States and other countries, the scope and range of government intervention in economic life has enormously expanded. This development is in large part directed toward the prevention of business depressions, but it also embodies, very definitely, the conception that the government can plan and promote a long-term economic development and achieve our national goals far better than can a system of private enterprise.

The control measures of the Roosevelt administration did not strike directly at the basic principles of private enterprise. The advantages of competition were emphasized. Consumer choices in free markets and the price and profit mechanism were in the main relied upon to guide the allocation of productive energies. The goals were the curbing of monopolistic and other alleged abuses of large-scale business, the supplementation of private by public enterprise in neglected fields, the promotion of permanent prosperity by raising the incomes of the masses and lowering the incomes of the classes, and the control of the business cycle by means of fiscal and monetary policies.

War Controls

The Truman administration inherited a vast control mechanism that had been developed to meet the requirements of war. Many of these were retained for a year or more after the war—until public opinion and difficulties of enforcement combined to force their abandonment. Repeatedly, however, the Administration has asked for the power to restore them in order to prevent both inflation and deflation and to preserve economic stability. Finally, in 1949 the conception of the government's responsibility was extended to include, when deemed necessary by the President, direct participation in industrial enterprise through building plants and engaging in production.

This conception found expression in the Spence bill, strongly backed by the Administration and by two members of the President's Council of Economic Advisers. In the words of John D. Clark, in interpreting the President's conception to the joint Committee of Congress:

"Encouragement of productive capacity is so essential to continued maximum employment and production that neither the concealed dangers in any given plan nor the required scope of government intervention should prevent action which will be effective. The President has shown how earnestly he seeks effective action by declaring that if it comes to the point where the people cannot be furnished goods which they need in any other way, and it is possible for them to secure them by having the government itself become a producer, he is not afraid to take that final step."

Power to President

The bill would vest in the President of the United States the power to formulate national production requirements in line with his conceptions as to what is necessary for the people's welfare. The President shall "determine approximately the quantity goals to which it is necessary and feasible to increase the supply within a specified reasonable period of time." He may contract with private industry, research laboratories, and scientific or educational institutions for research or development related to the improved utilization of designated materials or facilities, on such terms and conditions as the President deems necessary. He may make loans to private industry (particularly small or independent enterprises) or to state and local governments for the expansion of capacity and production—on such terms and conditions as the President deems necessary. And whenever the President finds that a person who has received financial assistance is unable because of unfavorable nation-wide economic conditions to pay current interest on, or repay the principal of, the loan such payments may be reduced or deferred in whole or in part. Finally, the President may also contract

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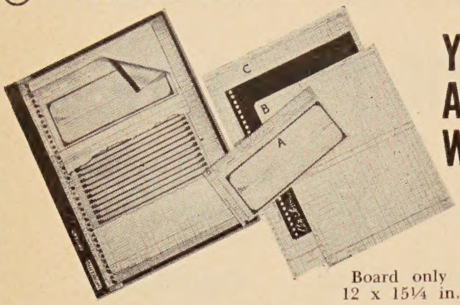

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with private companies to construc new plants or expand or rehabi itate existing plant facilities an enter into contracts with private individuals for the operation of suc plants. To this end the Presiden is authorized to acquire real an other property, as he deems necessary.

While the Act does not expressly authorize the government to construct and operate the plants itsel it may reasonably be assumed tha if private enterprise proved reluctant (recalcitrant would presumabl be the word) the President, according to Adviser John D. Clark, "i not afraid to take the final step and become a producer.

This program is designed no merely to prevent periodic busines recessions. It is based on the conception that unless the state proceeds along the lines indicated w shall have continuous industria stagnation.

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This program in its conceptio goes far beyond anything heretofore suggested. It is potentially more far-reaching in the scope o its influence than the mere socialization of selected key industries It is essentially totalitarian, since it embodies a master plan in which the state determines the allocation of productive resources, in line with what the government conceives to be required. It would inevitably result in the elimination of the guidance of economic activity afforded by consumer demands as expressed in the market places and substitute therefor the judgments of government officials as to what the people need and can have.

I lay emphasis upon the totalitarian character of this program for two reasons: First, because once embarked upon a plan under which the government decides what kinds of products the people want, and then underwrites or directly carries out the production thereof, the end of private enterprise system will be at hand. Second, because those who advance this measure contend that they are committed to the principle of private enterprise and opposed to both socialism and communism. Whether this official attitude is disingenuous or merely naive is immaterial. The result will be the same.

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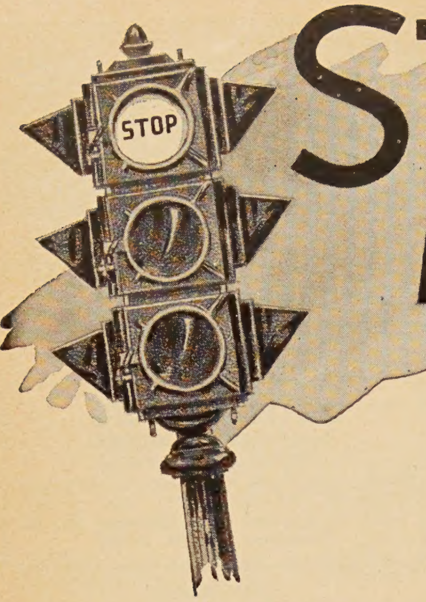

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* * *

Mother: "Where is Jimmy this afternoon?"

Dad: "If he knows as much about canoes as he thinks he does, he is out canoeing, but if he doesn't know any more about it than I think he does, he's swimming."

* * *

Cannibal King: "What am I have for lunch?"

Cook: "Two old maids."

Cannibal: "Ugh! Left-overs again."

* * *

A little six-year-old boy came to his father with the inevitable question, "Where did I come from?" The father had been expecting to hear the question at some time and was fully prepared. When he finished his thorough and factual explanation an hour later, he asked his son "Why did you want to know where you came from?"

The boy answered, "My boy friend, Johnny, comes from Toledo, and I wanted to know where I came from."

* * *

After several hours of luckless fishing, the little girl suddenly threw down her pole and cried, "I quit."

"What's the matter?" her father asked.

"Nothing," said the child, "except that I can't seem to get waited on."

* * *

Father: "Yes, my boy, I'm a self-made man."

Son: "Gee, Pop, that's what I admire about you. You always take the blame for everything."

The rich man was interviewing an applicant for a job as his personal valet. "You may have trouble with me," he said. "I have a wooden leg, a glass eye, a toupee, and false teeth."

"That won't bother me," repl'd the applicant. "I used to be on the assembly line."

* * *

Tommy: "Can you eat nuts, grandma?"

Grandma: "Oh, dear, no, I haven't any teeth."

Tommy: "Well, look after these till I come back from school."

* * *

A bride-to-be was showing her friend a list of guests to be invited to the wedding. After her friend had read the names she looked puzzled.

"What's the matter?" asked the bride-to-be.

"Isn't it rather strange," queried the friend, "you have only put down the names of married couples?"

"Yes, that was Jack's idea. Don't you think it's rather clever? He says that if we invite only married people, the presents will be all clear profit."

Two labor leaders in a hotel lobby in Washington following a conference watched as two pretty young girls met and kissed each other affectionately.

"There's another of those things that are so unfair," remarked one morosely.

"What do you mean?" asked his companion.

"Women doing men's work," came the answer.

* * *

"How's business, old man?"

"Picking up a little, I'm glad to say. As a matter of fact, one of our salesmen came in yesterday with $500 order."

"I don't believe it."

"It's true. I can show you the cancellation."

* * *

Judge "Did you see that shot that was fired?"

Witness: "No, I only heard it."

Judge: "That is not sufficient evidence. You may sit down."

As the witness left the stand and while his back was turned to the judge, he laughed out loud. At once the judge recalled him for contempt of court.

Witness: "Did you see me laugh?"

Judge: "No, but I heard you."

Witness: "Insufficient evidence, Judge."

* * *

Nudism is a back-to-the form movement.

* * *

In filling out an application for a factory job, a man puzzled for a long time over this question: Person to notify in case of accident?

Finally he wrote: "Anybody in sight."

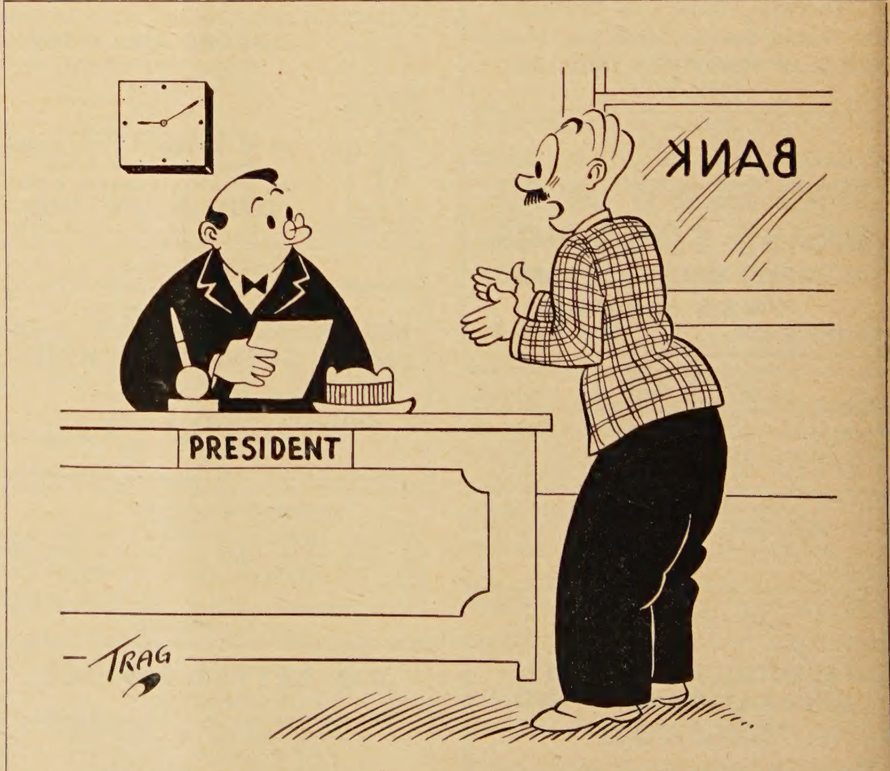
* * *

Life Insurance Actuary: "At the age of 75 there are 18 per cent more women than men."

Agent: "At 75, who cares?"

* * *

A pedestrian is a motorist who finally found a parking place.



"I'm sorry I'm late, Mr. Jones ... I was looking for another job!"